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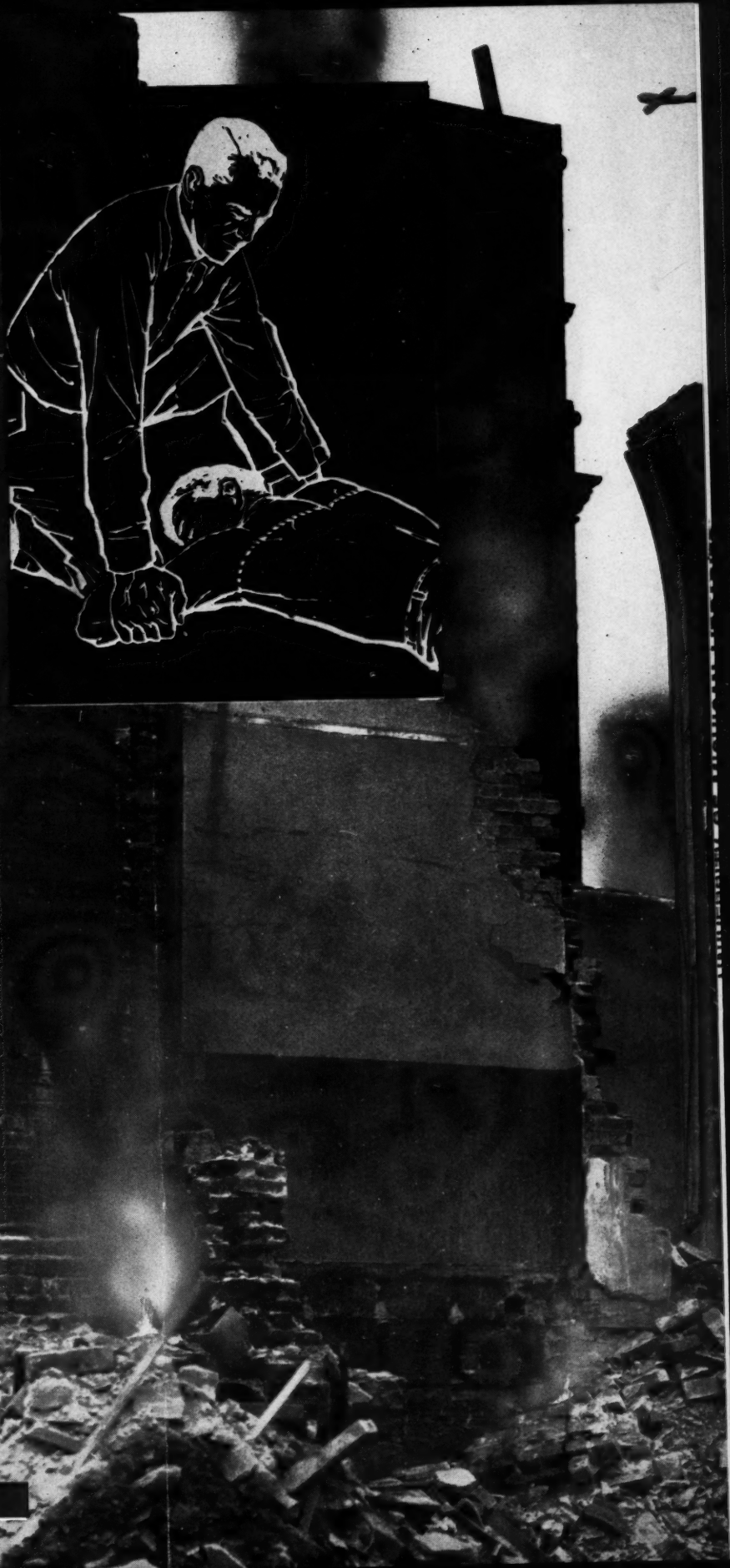
Dental Digest

June 1952

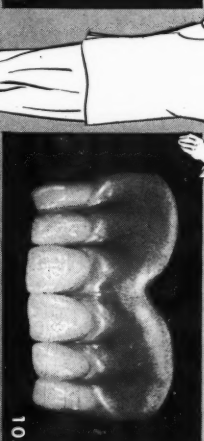
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About Our

CONTRIBUTORS

S. IRVING COPEN, D.M.D. (Tufts College Dental School, 1918) adds a further contribution to the subject of co-medication, presenting in this issue the results gained from study of 203 case reports, **PREMEDICATION BY CO-MEDICATION IN LOCAL ANESTHESIA**.

LEE A. KAPILOW, D.D.S. (University of Pittsburgh, School of Dentistry, 1943) is a general practitioner whose article, **SIMPLE REPLACEMENT OF A FRACTURED TRUPONTIC**, describes a useful method for correction when such an accident occurs.

JOHN B. DAVIS, B.S., D.D.S. (Northwestern University, Dental School, 1935) who has experimented consistently with the Airdent unit, reports in this issue the outstanding merits and drawbacks of this adjunct when used in personal practice.

BERNARD J. GARN, B.S. (College of the City of New York, 1940), **D.D.S.** (New York University, College of Dentistry, 1943) in his article, **CHRONIC TENSIONS IN THE SKELETAL MUSCULATURE AND THEIR RELATIONSHIPS TO DENTAL DISEASE**, presents a series of hypotheses from which conclusions are drawn in support of the author's theory that emotional and muscular tensions are coexistent and interdependent.

EDWARD J. RYAN, B.S., D.D.S., Editor

WANDA T. PICKARD, B.A., Assistant Editor

708 Church Street, Evanston, Illinois

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The magazine is mailed on the fifteenth of the month of issue.

PREMEDICATION *by* CO-MEDICATION

in Local Anesthesia - 203 Case Reports

S. IRVING COPEN, D.M.D., Boston

DIGEST

The purpose of the operations analyzed in this article was to establish a positive value in the use of isonipecaine (demerol hydrochloride) in combination with injection local anesthesia, and to observe the behavior of patients who come to a large metropolitan hospital for treatment. It was believed that a more complete and widespread application of co-medication techniques should be studied so that with the dosages outlined its use as a safe and valuable procedure in the dental office could be established.

Classification of Operations

The operations* performed were divided into three groups:

Group 1. Sixty cases using demerol hydrochloride in combination with novocain (2 per cent) with pontocaine (0.15 per cent) and cobefrin (1:10,000).

Group 2. Sixty cases using demerol hydrochloride in combination with monocaine hydrochloride (1.5 per cent with epinephrine 1:50,000 and 1:100,000).

Group 3. Eighty-three cases using demerol hydrochloride in combination with monocaine hydrochloride

and novocain-pontocaine-cobefrin (intermixed).

Intermixed Technique—When the initial injection was made with demerol hydrochloride combined with monocaine hydrochloride, all supplemental injections were made with novocain-pontocaine-cobefrin. When the initial injection was made with demerol hydrochloride combined with novocain-pontocaine-cobefrin, all supplemental injections were made with monocaine hydrochloride.

Choice of Patients—Most patients were not informed of the contents of the injected solutions, particularly in the use of demerol hydrochloride. Whenever possible, patients were chosen who were known from previous hospital visits to have been apprehensive and fearful. Many types of operations pertaining to the dental field were performed. Different dosages of demerol hydrochloride were investigated in combination with monocaine hydrochloride and novocain-pontocaine-cobefrin to determine the amounts that would be most satisfactory for the ambulatory patient in the dental office.

General Considerations

1. Summary reports from the surgeons verified the premise that there is an increasingly intelligent interest in the psychologic problems of apprehensive patients among the progressive members of the dental profession.

2. On the basis of earlier reports published and the interest expressed,

the author appreciates the willingness of the surgeons to complete the experiments studied.

3. Published papers,^{1,2,3,4,5,6,7,8,9,10,11,12,14} the author's experiences, and the numerous comments received, encourage support of the continued use of co-medication in this phase of dentistry.

4. Co-medication techniques for the operations reviewed were the same as those described in previous papers.^{1,2,4,5,11} These procedures are also currently in use, as herein illustrated.**

5. Hospital study records compiled for each patient substantiate the conclusions of this report; these observations will probably equal similar operations in other hospitals.

**One cubic centimeter (1.0) demerol hydrochloride (50.0 milligrams) was the dosage used in these illustrations. Variance of this dosage can be computed from the illustrations by observing the notches on the Anestube syringe, the measuring marks on the Luer syringe, and the accompanying directions.

¹Copen, S. Irving: Premedication by Co-medication in Local Anesthesia, Am. J. Orthodontics (Oral Surg. Section) **33**:290-300 (April) 1947.

²Copen, S. Irving: Premedication by Co-medication in Local Anesthesia, Massachusetts Dent. Soc. Bull. **23**:22-31 (April) 1947.

³Editorial, DENTAL DIGEST **53**:299 (June) 1947.

⁴Copen, S. Irving: The Problem of Apprehension and Anxiety in Dentistry, DENTAL DIGEST **54**:258-259 (June) 1948.

⁵Copen, S. Irving: Premedication by Co-medication in Local Anesthesia, *ibid.* **54**:309-314 (July) 1948.

⁶Holland, Daniel J., Jr.: Complications in Exodontia and Oral Surgery, Oral Surg., Oral Med., and Oral Path. (Oral Surg. Section) **1**:760 (August) 1948.

⁷Fink, I. J.: The Ideal Anesthetic for the Cardiac Patient, Bull. Hudson County Dent. Soc. **18**:21-22 (November) 1948.

⁸Saghirian, Levon M.: Pocket Elimination by Electrosurgery, DENTAL DIGEST **55**:158 (April) 1949.

⁹Abramson, Allyn S.: Anesthetics in Oral Surgery, Dental Survey **25**:1136 (August) 1949.

¹⁰Oman, Carl R., and Sherman, Harold: Co-medication in Operative Dentistry, J. Dent. Res. **28**:530 (October) 1949.

¹¹Copen, S. Irving: Salivary Secretions Reduced by Co-medication in Local Anesthesia, DENTAL DIGEST **56**:68-73 (February) 1950.

¹²Sherman, Harold, and Oman, Carl R.: Combined Anesthesia in General Dentistry, J.A.D.A. **42**:294-302 (March) 1951.

¹⁴Nepola, S. R.: Clinical Experience with Demerol Co-medication in Dental Local Anesthesia, Oral Surg., Oral Med., and Oral Path. (Anesth. Section) **4**:456-462 (April) 1951.

*Author's Note: The operations evaluated in this article were performed by Stephen P. Mallett, D.M.D., Oral Surgeon in Chief; James E. Bryan, D.D.S., Resident Oral Surgeon; and the Oral Surgery Staff, Boston City Hospital, between May 21, 1948 and September 16, 1949. Sincere gratitude is expressed to these oral surgeons for their continued cooperation and assistance in the scientific evaluation of this research.

Characteristics of Patients

The Extremely Apprehensive Patient—Many patients were of the extremely apprehensive and nervous type who feared dental operations and procrastinated until discomfort became severe. In these patients, enough confidence was established by the surgeons to allow the injection of the anesthetic solution. The injections were made without the patient's awareness that a sedative was injected with the local anesthetic. By intention, no topical anesthetic was used. The operations followed without their objection to surgery.

Responsiveness Increased—Patients who were not particularly nervous about the anesthesia or operation, because they had had painless and successful dental procedures before, were also included in our study cases, and they were found to respond to co-medication with even greater re-

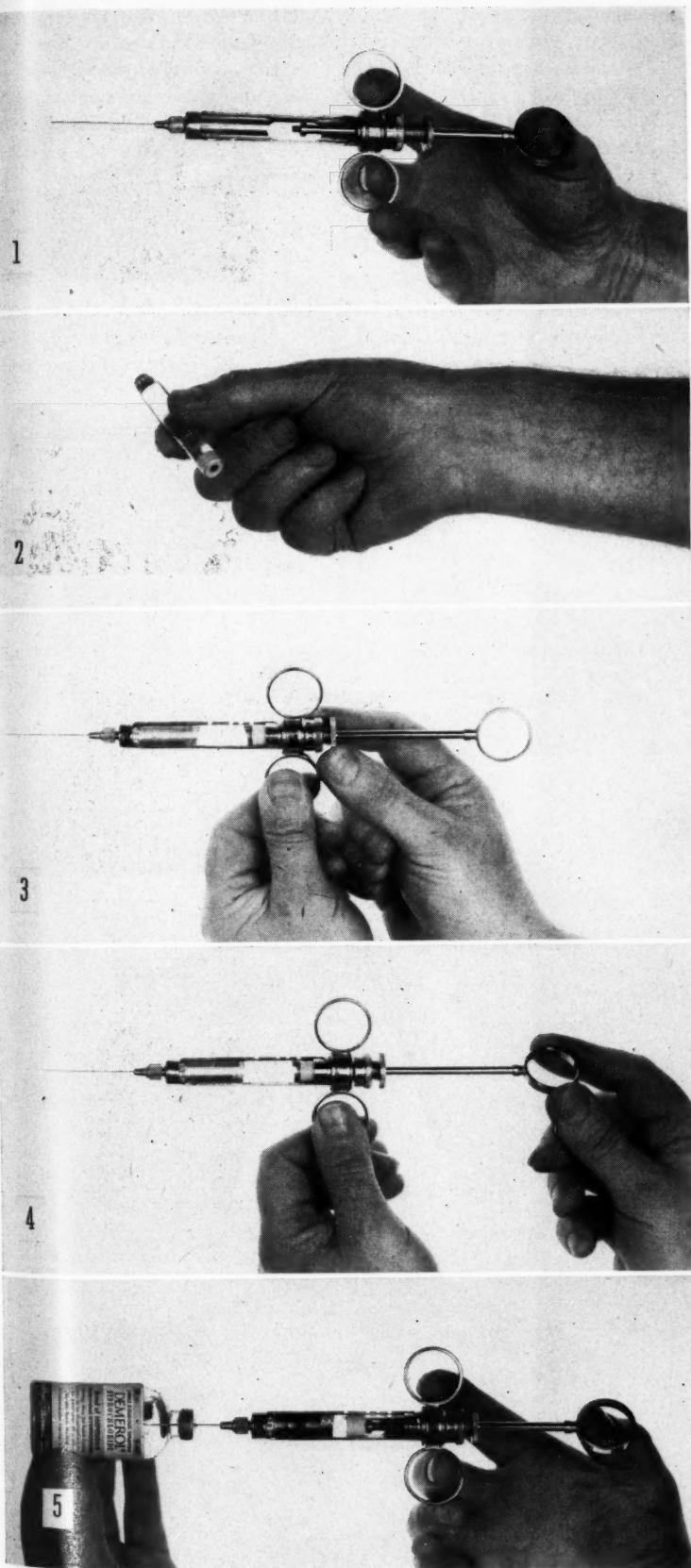
1. Anestube syringe. Observe the knurled screw which firmly holds the anestube and the threaded piston rod which screws into the thread of the rubber plunger.

2. Anestube containing 2.25 cubic centimeters of monocaine hydrochloride. Observe thread of recessed rubber plunger.

3. Anestube syringe containing an anestube. Turn knurled screw to hold the anestube firmly in syringe. Observe the four small notches on the upper surface of the body of syringe. Spaces between the first three notches are each $\frac{3}{16}$ inch. Space between the first and last notch is $\frac{1}{4}$ inch. Total space contains approximately 1.0 cubic centimeter of monocaine hydrochloride.

4. Screwing threaded piston rod into thread of rubber plunger.

5. Syringe with needle inserted into ampul containing demerol hydrochloride. Observe that the rubber plunger has been pushed down to the furthest notch. The anestube content is thus reduced from 2.25 cubic centimeters to 1.25 cubic centimeters of monocaine hydrochloride.



laxation and satisfaction than heretofore.

Apprehension Lessened—Patients with known cardiac disturbances showed a definite lessening of their restlessness by comparison with previous histories. In fact, this general lessening of restlessness was evident in all of the specific cases where marked restlessness had been previously exhibited, and although a repetition of apprehension was anticipated, it did not develop.

Individual Evaluation—The important factor in this study was that it was necessary for each patient to be individually evaluated for the proper dosage of demerol hydrochloride. All the patients were ambulatory and it was essential that they should be able to proceed home safely. In this evaluation the dosages of demerol hydrochloride used were 12.5, 25.0, 37.5, 50.0, 67.5, 75.0, and 100.0 milligrams.†

Variation in Dosage—The injections were submucosal, and deeper, as in conduction anesthesia, and were administered slowly. The youngest

†Reference is again made to demerol hydrochloride as a narcotic. A Federal Narcotic License is required for its administration whether used alone or in combination with an injection local anesthetic.

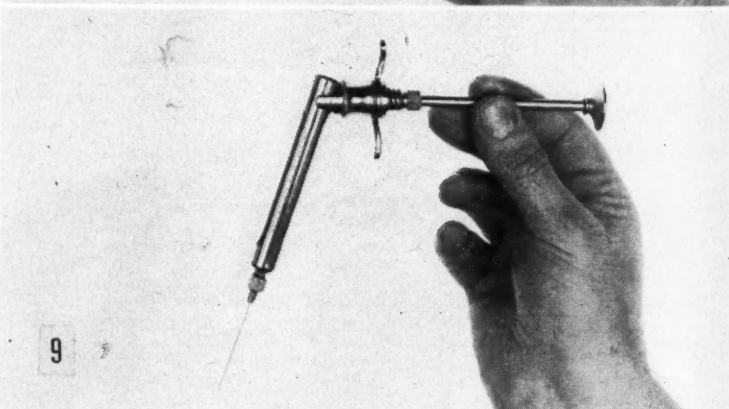
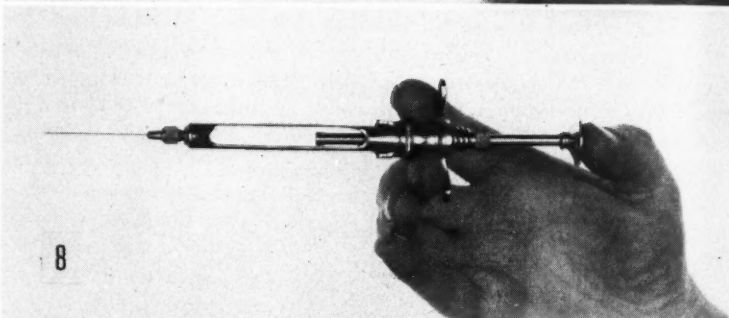
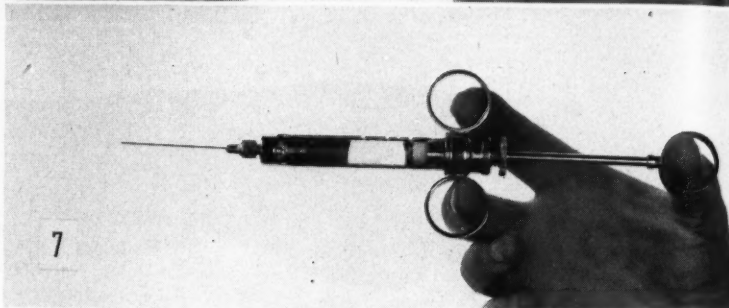
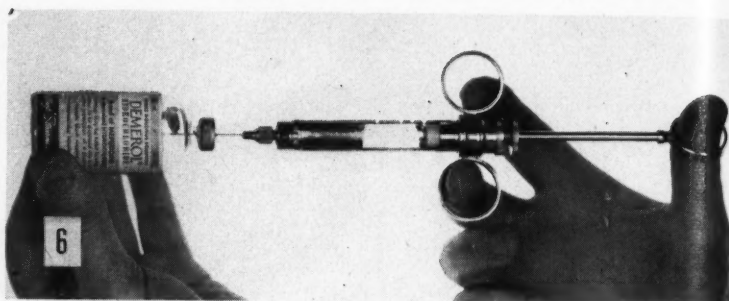
6. Piston rod has been completely pulled back. One cubic centimeter (1.0) demerol hydrochloride (50.0 milligrams) has been drawn into the anestube.

7. Syringe with anestube filled. It now contains 1.25 cubic centimeters of monacaine hydrochloride in combination with 1.0 cubic centimeter of demerol hydrochloride (50.0 milligrams.)

8. Cook-Waite syringe. Observe the lock screw which firmly holds the carpule.

9. Syringe is unlocked and opened to permit the easy placing of a carpule.

10. Luer type glass syringe with needle inserted into ampul containing demerol hydrochloride. Observe that the glass plunger has been pulled back to 1.0 centimeter mark on the syringe. One cubic centimeter (1.0) demerol hydrochloride (50.0 milligrams) has been drawn into the Luer syringe.



patient was six years of age and the oldest was eighty-one. Dosage was distributed in the following manner:

Five patients received 12.5 milligrams of demerol hydrochloride.

Eighty-six patients received 25.0 milligrams of demerol hydrochloride.

Thirty-five patients received 37.5 milligrams of demerol hydrochloride.

Seventy-four patients received 50.0 milligrams of demerol hydrochloride.

One patient received 67.5 milligrams of demerol hydrochloride.

One patient received 75.0 milli-

grams of demerol hydrochloride.

One patient received 100.0 milligrams of demerol hydrochloride.

Operations Performed

The types of operations performed and the combined medication used in each are described in the table on the following page.

Effect of Relaxation Indicated

These studies present evidence that a relaxation effect does take place

when combining demerol hydrochloride with an injection local anesthetic. In contrast, no relaxation effect was obtained in similar operations when identical amounts of the injection local anesthetic were used alone.

Time Element—1. The relaxation effect was fairly rapid, from five to ten minutes, and lasted thirty minutes to one hour, but did not decrease the effect of the anesthesia.

2. Whenever larger doses of demerol hydrochloride were used the relaxation effect lasted even longer.

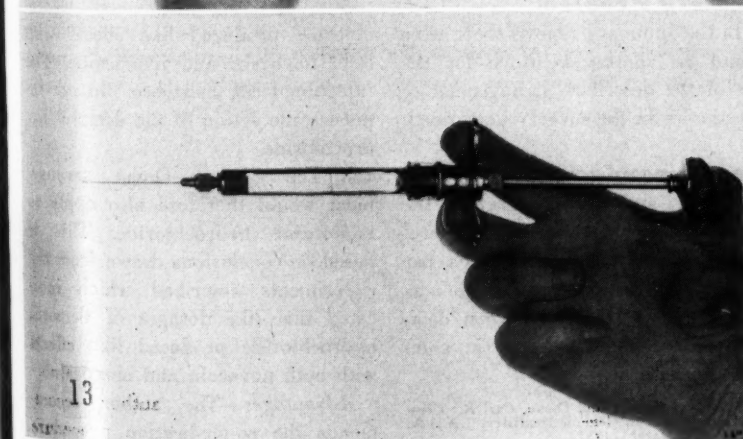
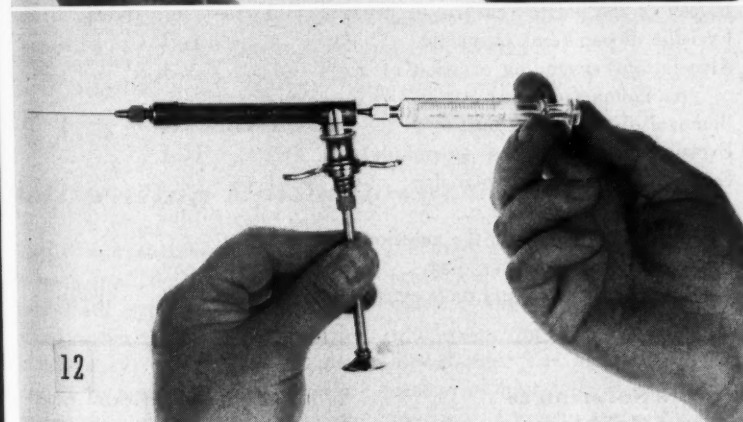
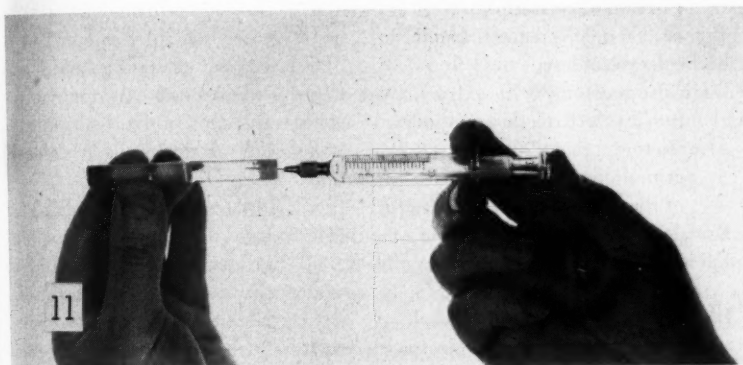
3. The time element of the relaxation effect is not increased in proportion to the increased amount of demerol hydrochloride used.

4. An increase in the relaxation effect does take place with increased amounts.

5. Although the time element when using 25.0 milligrams was approximately one hour, when the amount was tripled the duration of the relaxation effect was only approximately doubled.

Effects Extended—Postoperative information on these groups showed that the relaxation effect in many cases lasted even after the patients left the hospital and was sustained for a long enough period for them to reach their destinations safely.

No Complications—There were no



11. The Luer syringe removed from ampul and inserted into the rubber plunger of the carpule.

12. The carpule connected to the Luer syringe is placed in the barrel of the Cook-Waite syringe. The opposite end of the carpule is punctured by the inner point of the double pointed needle. Contents of the Luer syringe are pushed into the carpule. This step causes an equal amount of novocain-pontocaine-cobefrin to be expelled through the double pointed needle on the opposite end.

13. Luer syringe removed. Cook-Waite syringe is locked with lock screw. The carpule now contains 1.25 cubic centimeters of novocain-pontocaine-cobefrin in combination with 1.0 cubic centimeter of demerol hydrochloride (50.0 milligrams).

complications during the operations other than those that could have arisen because of the operation itself. Since all of the operations were in the oral cavity, the antisialogogue action of the demerol hydrochloride was extremely helpful. Nausea and syncope were negligible.

Reaction Favorable—Patients in poor physical condition reacted favorably with co-medication. They were much calmer, more cooperative, and demonstrated a willingness to return for continued surgery when necessary.

Amounts of Anesthetic Administered

It was the general opinion of those who participated in the present evaluation that up to 50.0 milligrams of demerol hydrochloride per normal adult was a safe amount to administer submucosally in combination with injection local anesthetics for the ambulatory patient in the dental office.

Areas to be Anesthetized—Amounts up to 50.0 milligrams of demerol hydrochloride can also apply to the oral ingestion method or by injecting under the skin (parenteral) in other areas of the body, such as the deltoid region.

Supplemental Injections—Caution must be exercised when using supplemental injections of the local anesthetic solution at the same time. This should be done without adding the demerol hydrochloride to it.

Results Satisfactory—Slightly disagreeable symptoms observed in the 203 cases operated upon were the following:

Two cases of vomiting

Three cases of slight dizziness

One case of accidental urination

Patient Satisfaction—Several surgeons operated on some of the patients under review more than once and were enabled to make reliable comparisons of the conditions that prevailed with or without the use of co-medication. The reports of the surgeons were that the results were gratifying; all patients expressed satisfaction with the anesthesia administered and the alleviation of anxiety.

Types of Operations

| Operations Performed | Group 1 | Group 2 | Group 3 |
|---|---------|---------|---------|
| Extractions (single and multiple). | 1 | 3 | 13 |
| Surgical removal of impacted teeth (single and multiple). | 2 | 4 | 9 |
| Alveolectomy. | 1 | 1 | |
| Alveolectomy with extraction of the involved teeth (multiple). | 37 | 34 | 52 |
| Alveolectomy including the excision of necrotic masses (multiple) with extraction of the involved teeth (multiple). | | 1 | |
| Alveolectomy including a radical cystectomy (multiple) with extraction of the involved teeth (multiple). | 7 | 2 | 2 |
| Radical cystectomy. | 1 | | |
| Radical cystectomy with extraction of the involved teeth (multiple). | | 1 | |
| Alveolectomy including curettage of granulomas (multiple) with extraction of the involved teeth (multiple). | 5 | 7 | 5 |
| Excision of hypertrophic tissue (maxilla). | 1 | 2 | |
| Excision of fibrous mass in maxilla (electro-surgery). | | 1 | 1 |
| Biopsy of a lesion on the lateral border of the tongue (electro-surgery). | 2 | | |
| Biopsy of the palate (electro-surgery). | 1 | | |
| Excision of papilloma on palate. | | 1 | |
| Alveolectomy including excision of a papilloma (maxilla). | | 1 | |
| Removal of torus palatinus. | | 1 | 1 |
| Excision of necrotic mass (mandible). | | 1 | |
| Excision of lower 3rd molar flap (electro-surgery). | 1 | | |
| Removal of a sialolith in the anterior portion of Wharton's duct. | 1 | | |
| Total number of teeth and roots extracted. | 350 | 358 | 441 |

Possible Solution to Anxiety Problem

In the summary reports there were found no contraindications for the use of the described arrangement of anesthetics in the surgery performed.

Recommendations

1. The author recommends the Sherman-Oman¹³ dosage for demerol hydrochloride (35.0 milligrams per 150 pounds of adult body weight) as a safe and reliable rule when demerol hydrochloride is used in combination with novocain.

¹³Sherman, Harold, and Oman, Carl R.: Combined Anesthesia in General Dentistry, J.A.D.A. 42:294-302 (March) 1951.

2. In the present series of experiments like dosages of demerol hydrochloride produced like effects with both novocain and monocaine. The injection local anesthetic did not influence the action of the demerol hydrochloride.

3. The Sherman-Oman arrangement would therefore also apply to monocaine hydrochloride. This is based on conclusions drawn from the experiments described which indicated that like dosages of demerol hydrochloride produced like effects with both novocain and monocaine.

Advantages—The author recommends the co-medication procedure

described because of the following advantages possessed by the technique:

1. The technique is an effective and safe procedure in the management of the anxious and apprehensive patient in the dental office.

2. The onset of the relaxation effect is approximately the same as that of the anesthetic itself which does not interfere with office appointments.

3. The termination of the relaxation effect is within one hour in most cases and does not interfere with office arrangements.

4. The need for an escort is optional, depending on the case.

Corroborative Report—In a recently published report on this subject Nepola's¹⁴ summary is the following:¹⁵

"Clinical experience with novocain-pontocaine-cobefrin and demerol in 140 patients produced: (1) Better than average local anesthesia and enabled thorough, painstaking operations with maximum patient cooperation. In operative dentistry there was

noted a marked and highly desirable antisialogogue or atropine-like action. (2) Novocain-pontocaine-cobefrin with demerol successfully controlled apprehension and anxiety and assisted materially in dispelling deep-seated fears of dental procedures. (3) Novocain-pontocaine-cobefrin with demerol produced a 2 per cent incidence of undesirable side effects such as nausea, fainting, and dizziness. Incidence of euphoria was slight, 8 per cent; marked, 80 per cent; and pronounced, 12 per cent. (4) Average dosages with which best results were obtained were up to 25.0 milligrams per cartridge for the child, 37.5 milligrams for the average adult, and up to 50.0 milligrams for the well-nourished, robust 150 pound adult."

Conclusions

Co-medication, a new means for the control of anxiety and apprehension has been used in the present experiments without complications. The relaxation effect obtains rapidly and usually terminates with the completion of treatment.

In the selection of the cases dis-

cussed it was attempted to include patients who had reacted unfavorably to injection local anesthesia when used alone. In almost every case these patients, when informed that a sedative had been added to the anesthetic which produced their relaxation effect, expressed a positive preference for its continued use.

Up to the present and with reference to the most recent publications^{12, 14} there appear to be no contraindications for the use of the recommended combinations of medications, provided the dosages outlined are used.

Summary

The results of 203 clinical operations in which demerol hydrochloride was combined with injection local anesthetics have been reviewed. This evaluation is intended to report progress of the experiences in the use of co-medication. Preliminary impressions have been supported through the clinical studies presented. The information obtained supports earlier experiments. Further clinical experimentation is warranted.

29 Commonwealth Avenue.

Infiltrating Epithelioma of Tongue

LINGUAL epitheliomas most frequently result from the friction or irritation caused by teeth that are badly placed or have sharp edges. Injuries to the sides of the tongue soon give rise to reparative epithelial hyperplasia, which degenerates easily into squamous cell carcinoma. Electro-galvanic currents originating from metals of varying electrostatic poten-

tial used in dentistry may cause repeated burns of the buccolingual mucosa, giving rise to leukoplakia, which sooner or later degenerates into epithelioma. The authors¹ report a case of infiltrating epithelioma of the tongue in a woman aged 70 that was apparently caused by friction of the

¹Vilanova, K., and Oller, F.: Infiltrating Epithelioma of Tongue Probably Caused by Dental Prosthesis, *Actas Dermo-Sifiliograficas*, Madrid 42:749-826 (May) 1951.

tongue against a prosthetic palate she had worn since she was 14. They state that such cases may increase as a result of ill-considered extraction of the teeth with subsequent use of prostheses, in an effort to eliminate foci of infection.

From Medical Literature Abstracts, *Journal of the American Medical Association* 147:1603 (Dec. 15) 1951.

Simple Replacement of a FRACTURED TRUPONTIC

LEE A. KAPILOW, D.D.S., New York

DIGEST

One of the most annoying and unexpected accidents which may occur in fixed bridges is the fracture of a Trupontic (interchangeable porcelain end or saddle type pontic). Breakage is rare with this pontic since there is usually a sufficient bulk of porcelain, and all biting stress is directed

upon the gold occlusal surface to which the porcelain is cemented. Occasionally, however, fracture will occur and replacement becomes a vexing problem to the dentist.

This article gives step-by-step directions for an extremely useful method of replacement when such a fracture occurs.

impression of the area in order to make an indirect replacement (1) because of tissue and tooth undercuts, and (2) because the impression must be taken from the buccal inward.

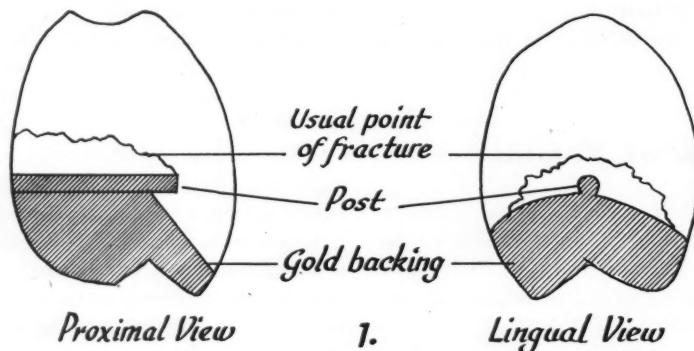
Fractures at Weakest Point—Fortunately, virtually all fractures in this type of pontic will occur around the slot which is the weakest point of the porcelain (Fig. 1). As a result, most of the pontic remains intact leaving only a small porcelain fragment adherent to the backing. The thicker buccal surface through which the slot does not extend is in almost all cases intact.

Recementation Attempts Unsuccessful—Usually, the loose portion can be reinserted, although an attempt merely to recement the parts will not succeed.

Technique of Replacement

1. Taking advantage of the ability to reinsert the loose piece, proceed to remove the adherent portion from the backing. Use any means available, such as diamond stones, burs, or hand instruments. Care must be taken not to injure the post too severely although scarring of the backing is permissible.

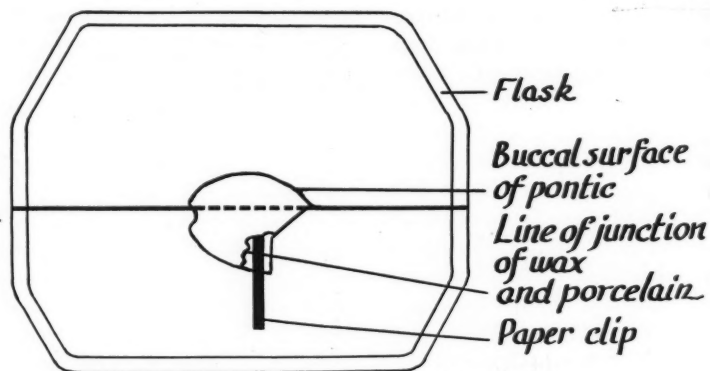
2. Inlay wax is now pooled onto the fractured surface of the pontic and it is forced to place on the backing in its original position. After trimming the excess wax the pontic is removed. A clear imprint of the post and backing will usually result on the first try. The inlay wax merely replaces that portion of the porcelain which was ground from the gold.



Technical Difficulties

In a situation where there is a fracture of a Trupontic, many of the commonly suggested corrections are extremely difficult to accomplish: 1. Obtaining a new stock tooth and attempting to grind it in directly is a formidable task even for the most adept practitioner, especially when the bridge occupies an inaccessible part of the mouth. Since the porcelain slides onto its post from a buccal direction, attaining a complete gingival fit is almost impossible.

2. Equally difficult is securing an



2. Cut-away view of flask

Method for Investing—The combined wax-porcelain pontic is now invested in a small flask in the following manner:

(1) A straight piece of paper clip is inserted in the post hole and allowed to protrude lingually about one-quarter inch.

(2) The paper clip is waxed securely to the pontic with a bit of sticky wax. (3) The lingual half of the assembly is invested in the bottom half of the flask and stone is brought up on the proximal surfaces

to the point of greatest convexity.

(4) The upper half of the flask can then be poured (Fig. 2).

(5) After heating, the flask can be opened, the porcelain picked out, and any remaining wax flushed out. The paper clip remains embedded in the stone.

Final Steps—A new pontic can now be processed in a proper shade of acrylic. Only slight finishing and polishing are necessary and the paper clip can be removed by twisting it out with hot pliers.

2. In the mouth the backing may be further scarred for additional retention and the pontic cemented to place with fast-setting acrylic.

Conclusion

This method of replacement is both simple and inexpensive and provides a new pontic that exactly matches the original in shape, fit, and color because the original is used as the pattern for the mold.

7 West 96th Street.

Consideration of the Pulp in Operative Procedures

LESTER R. CAHN, D.D.S.

VIRTUALLY every operation that the dentist performs involves the dental pulp. As a matter of fact, two life-sustaining physiologic functions; namely, eating and breathing, affect this structure. It speaks wonders for the protective and recuperative powers of the pulp that it is able to withstand the insults to which it is subjected and still survive.

Let us first examine the histologic structure of the pulp. The matrix of the pulp is a connective tissue in which lie odontoblasts, blood vessels, lymph vessels, nerves, and the so-called wandering resting cells which are a part of the reticuloendothelial system.

This connective tissue background has a fluffy, loosely textured structure closely resembling embryonal connective tissue or mesenchymal tissue. This is particularly true of the coronal and upper part of the pulp. It has been compared in appearance to Wharton's jelly. However, in the mature pulp this matrix is an adult connective tissue. The cells are fibroblasts and are fusiform, occasionally round and stellate in shape. They are connected by intercellular fibres. As Orban has pointed out, a silver impregnated section will show that the fibres are much more abundant than one would believe from viewing the same section stained with hematoxylin and eosin. However, for the

greater part of its existence the pulp is never a dense structure. And it is this loose arrangement of tissue that adds to its ability to withstand the varying traumatic influences that attack it.

We must remember that the pulp is housed in a bony casing that allows for little room for swelling. Transient edema and collections of inflammatory cells, the inflammatory exudate, which must continually form in the pulp as the result of extraneous irritations, can accumulate in this loosely arranged structure without too much fear of strangling the blood supply by compression. The only other structure in the body that is encased in bone, and where it is vital that its blood supply be protected against the pressure of transient exudates, is the brain, which also has a loosely textured structure.

The vascular supply of the pulp is profuse. This ensures adequate nutrition and enough collateral circulation to maintain the integrity of the tissue in the event that a small segment be deprived of its blood supply. Also, these vessels provide a way by which defense cells may reach a point of irritation. Exudate is absorbed via these vessels as well as by the lymphatics.

Lastly, it is possible that under normal conditions the regulation of temperature is provided by means of the

blood vessels in a way similar to that which occurs in the skin. When the tooth is overheated, the vessels dilate with loss of heat by conduction and radiation. Conversely, when the tooth is chilled, the vessels contract, conserving heat.

This fact should not give license to an operator to grind mercilessly a tooth without any thought to the vital pulp that is housed in the tooth. Particularly is the tooth abused under local anesthesia. There is no doubt that local anesthesia is a boon; but simply because sensory impulses have been numbed the tooth should not be attacked as a carpenter would attack a piece of wood. In fact, a well-grained and valuable piece of wood is handled with more care than some teeth.

I have examined, over the years, almost countless numbers of pulps histologically, and have been amazed to find how often pathologic changes were present. The lesions varied from a slight, inflammatory infiltration to abscess formation. Frequently these teeth gave no symptoms.

The one thing that all of us who operate upon teeth must remember is that the tooth is a vital, sensitive structure that should be handled gently and not abused.

Adapted from Guest Editorial, *New York State Dental Journal* 18:173-174 (April) 1952.

Technique of the Back-Pressure Arm Lift Method of Artificial Respiration



1. Correct positions for the back pressure-arm lift method of artificial respiration, recently adopted by the American National Red Cross upon recommendation of the National Research Council, are illustrated. The victim is placed prone with the elbows bent and with one hand upon the other. The cheek is placed on the hand, with the face turned slightly to one side. The operator kneels on one knee at the head of the victim.

To start the cycle, the operator places his hands on the victim's back, as shown, so that the thumbs just touch and the heels of the hands are just below a line running between the armpits.

2. The operator is shown as he rocks forward slowly, keeping the elbows straight, until his arms are approximately vertical, exerting steady pressure upon the chest.

3. The operator rocks backward, slowly sliding his hands to the victim's arms just above the elbows.

4. Continuing to rock backward, the rescuer raises the arms until resistance and tension are felt at the victim's shoulder. He then drops the arms and thus completes a full cycle. The cycles are repeated 12 times per minute, the expansion and compression phases being of equal length, and the release periods of minimum duration.

New Method of ARTIFICIAL RESPIRATION

Adopted by the Red Cross

DIGEST

Dentists should be prepared to give artificial respiration. The procedure described herein, an improved method of artificial respiration, known as the back-pressure arm-lift, has been adopted by the American National Red Cross, the armed services, several industrial firms, and other agencies and organizations.

Used in Norway, Denmark, and other European countries for many years, the method permits greater exchanges of air and can be administered without undue fatigue to the operator. The successive steps to be taken in the procedure are illustrated clearly.

Early Research

Before World War II when investigators first doubted the superiority of the prone pressure method, research was instituted which led to the present change in methods of artificial respiration. Since that time the Red Cross has conducted extensive studies in the fields of respiration and asphyxia. The armed forces became

intensely interested in artificial respiration in connection with the possibility of poison gas or nerve gas warfare. About two years ago the Army Chemical Corps appointed four research teams to study comparative values of various methods.

Results of Research—1. That the prone pressure method was less effective in the amount of air exchanged was demonstrated. It compresses the chest but does not actively expand it.

2. In the two-phase methods (such as the back-pressure arm-lift, the hip-lift, and the Silvester) the chest is actively expanded and compressed by the rescuer.

3. Experience also showed that the hip-lift back-pressure method and the hip-roll back-pressure method are difficult to perform and cannot be done at all by frail rescuers on heavy victims.

4. The Silvester method, for which the victim is placed on his back, was considered unsatisfactory for use by the general public since it is difficult to keep the air passages open.

Method Recommended—The back-pressure arm-lift method was recom-

mended because (1) it does not tire the rescuer unduly, (2) can be performed by a small person on a heavy victim, and (3) it is relatively easy to teach.

Technique of the Back-Pressure Arm-Lift Method

1. The victim is placed face down in a prone position with arms overhead and bent at the elbows, one hand upon the other, and the head turned to one side so that the cheek rests on the hands.

2. The rescuer, on one or both knees at the victim's head, places his hands on the victim's back, with thumbs just touching and the heels of the hands just below a line running between the victim's armpits.

3. The rescuer rocks forward slowly, elbows straight, until his arms are almost vertical, exerting steady pressure upon the back.

4. Now the rescuer rocks backward slowly and slides his hands to the victim's arms, just above the elbows, which are raised until resistance is felt at the victim's shoulders; then, the arms are dropped.

This completes a full cycle, which is repeated 12 times a minute.

Washington, D.C.

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The Use of the AIRDENT UNIT

in Private Practice

JOHN B. DAVIS, D.D.S., Clarksburg, W. Va.

DIGEST

Many dentists fail to accept the use of airbrasive technique as a practical procedure because they realize the differences that exist between personal practice and institutional requirements. It is the opinion of many operators that the airbrasive technique may be suitable for experimental purposes where operating time is not an economic factor; they are skeptical as to its practical value in busy personal practice. The author of this article has made use of the Airdent unit in his own office and has found it an extremely valuable adjunct to the conventional operating unit. The author and his associates have a highly favorable opinion of the unit and outline in this article numerous situations in which it is useful and describe the procedures that have been successfully employed.

Several Months' Successful Application

The author and his associates have had the Airdent unit in daily use in their office for about ten months. There have been no mechanical difficulties and the unit has functioned well in every respect. It is used (1) on approximately 80 per cent of cavity preparations that are made to receive alloy, silicate, direct curing resin, or gold foil restorations; and (2) for prophylaxis where stain or calculus removal are difficult. It has proved

to be completely thorough and a simple means of performing prophylaxis.

Comparative Advantages and Disadvantages of the Adjunct

In the time the Airdent unit has been in use by the author in his practice, the following advantages and disadvantages have been noted:

1. Premedication and local anesthetic are desirable in about 50 per cent of the cases that would require anesthesia in the use of rotary drills and stones.

2. It is entirely feasible to complete many cavity preparations by use of the airbrasive technique and hand instruments; in certain types of cavity preparations, however, it is difficult or impossible to use airbrasive technique at all.

3. If the operator uses the rubber dam in cavity preparation by use of rotary tools, he should likewise employ it in using airbrasive technique. In the author's practice other methods of keeping the field dry are usually preferred.

4. The abrasive has not been found objectionable because of dust and the recovery by means of the suction hood is satisfactory.

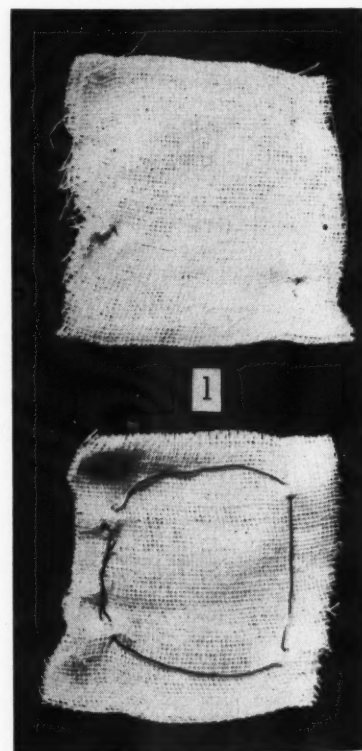
5. A mechanical arm has not been used to support the suction hood but as an assistant is considered essential in all dental operations an assistant should control the suction hood even if the mechanical arm is available.

6. In prolonged use, the operator's throat definitely becomes drier and

his mouth feels gritty and dry.

Procedural Features Noted—Operating time for many cavities is greatly decreased. This is particularly noticeable on anterior and cervical preparations. In some other types of preparations operating time is about the same but in no instance is it greater than with the use of rotary tools.

Fatigue Increased: The author had little success in using a mouth mirror for vision. For this reason, to secure direct vision in the operating field, the operator tends to stoop and



1. Shows gauze throat pack reinforced with bronze ligature wire.

bend more than normally. This factor has made operating more fatiguing than usual and has produced neck and back pains. When direct vision can be readily secured, operating with the airbrasive technique will be definitely easier than by any other means now available.

Patient Reaction Favorable: Adult patient reaction has been highly favorable in almost every instance although with children the reactions have not been so successful as with adults.

Means of Keeping Operating Field Dry: Means other than the rubber dam in cavity preparation may be employed. A saliva ejector, together with a damp gauze throat pack and cotton rolls surrounding the immediate field of operation, is quite satisfactory. If the gauze throat pack is stiffened by a soft wire (such as bronze ligature wire) around the edges it can be readily conformed or adapted to prevent the bulk of the abrasive collecting in the patient's mouth and throat (Figs. 1, 2, and 3).

Variety of Applications

1. Occlusal, incisal, and lingual rest preparations on natural teeth, and porcelain inlays or jackets can be accomplished readily and with greater ease to the patient and the dentist.

2. Incisal chips and fractures can likewise be easily smoothed with the Airdent.

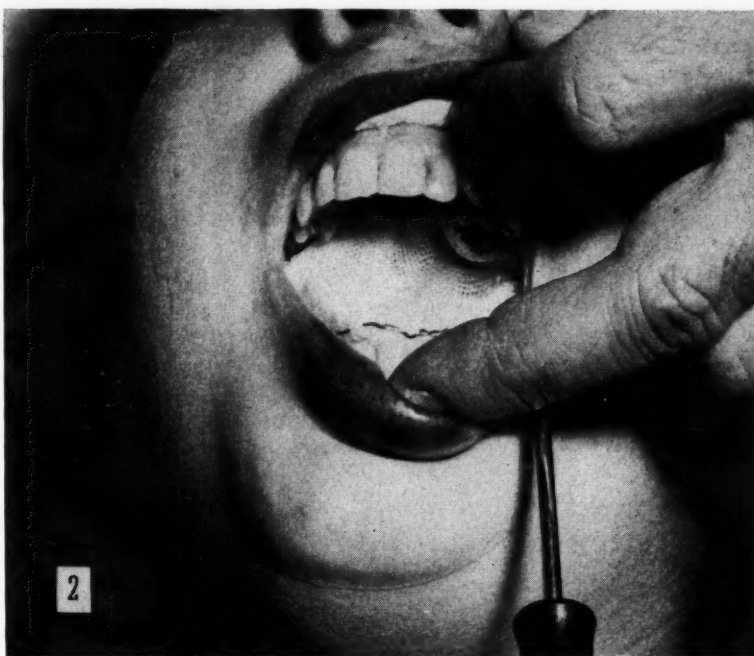
3. Silicate restorations and cement bases that require removal literally melt away in the airbrasive cutting stream.

4. Pinledge holes and three-quarter crown grooves are well suited to the technique.

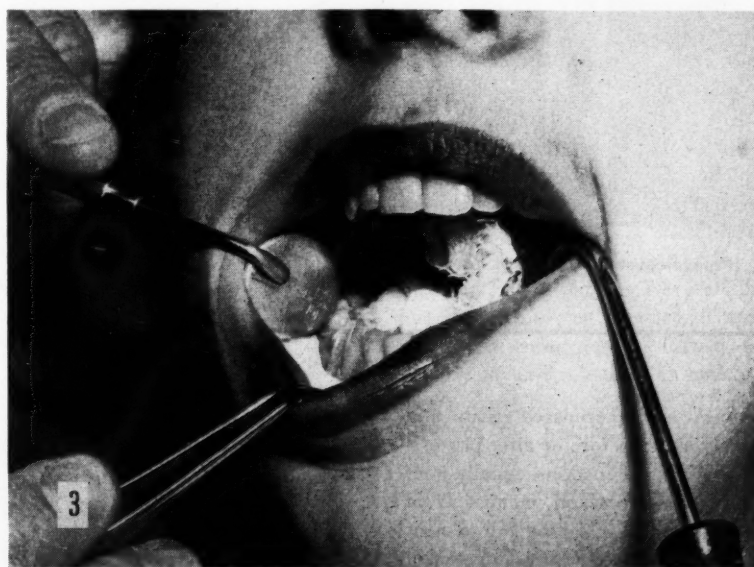
5. In thin enamel, such as incisal edges or incisal angles of anterior teeth, small, fine cuts can be made safely and quickly.

6. The technique is superior in placing retention points, or undercuts in all types of cavity preparation.

Cleaning Castings and Appliances—Outside the mouth the unit may be used to clean castings. It is much more efficient and more rapid than other methods. The unit is an excellent means of cleaning the inside of



2. Throat pack in place; upper arch.

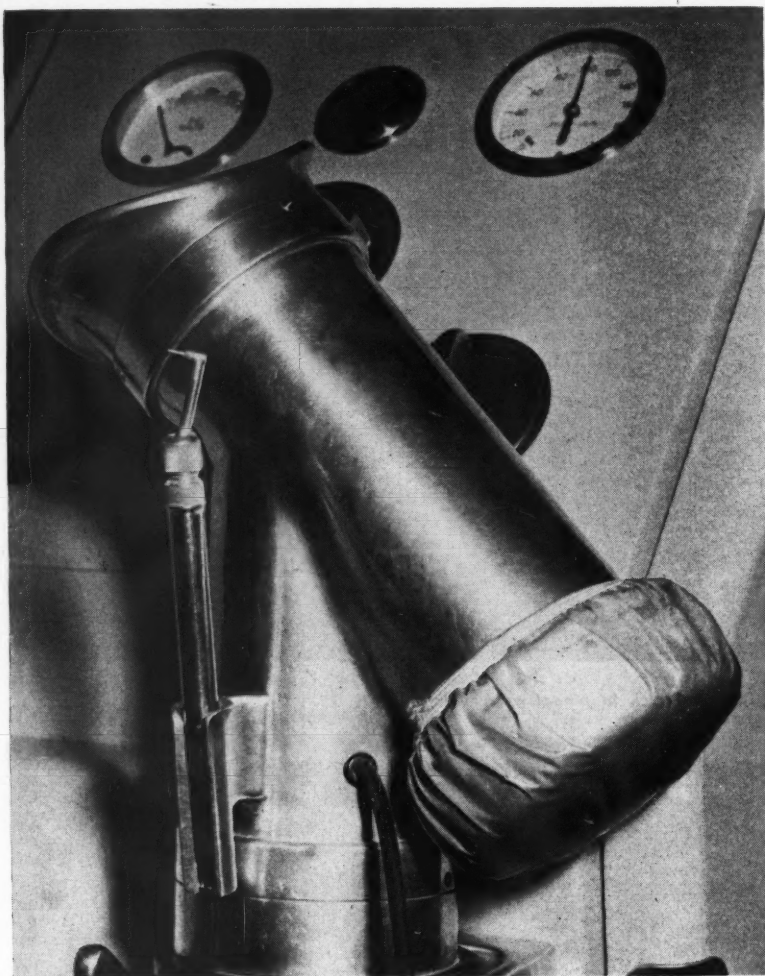


3. Throat pack in place; lower arch.

clasps and occlusal rests on removable partial dentures and removing calculus and stubborn stains from both acrylic and metal. The higher luster or final polish must be restored, of course, by the use of rouge or a similar polishing agent.

Routine Prophylaxis—Prophylaxis is done with cleaning powder and usually at low gas pressure.

Characterization in Porcelain Teeth. If it is desired to place alloy, gold, or silicate restorations in porcelain denture teeth for characterization, the



4. Plastic cover over suction hood.

cavities can be prepared easily and quickly either before or after processing. The unit functions equally well in removing cracked facings from bridges, and in cleaning old cement from an inlay or porcelain jacket crown prior to recementing.

Technical Aids Suggested

The following are a few practical measures that make operating with the unit easier or faster:

1. A plastic dish cover placed over the base of the suction hood effectively prevents the escape of dust that occurs when the nozzle tip is directed into the hood and the fluid-abrasive stream tested (Fig. 4). The

heat from the auxiliary operating light is no problem when this is done.

2. There is only 1 inch of clearance between the handle on the carbon dioxide tanks and the brace or frame that supports them and the regulator gauge. A rubber x-ray film holder or several thicknesses of adhesive tape placed over the brace will prevent skinned knuckles (Fig. 5).

3. A small dot of red enamel placed at the word "cutting" and of blue enamel at the word "cleaning" enables the operator to determine at a glance that the proper setting is made.

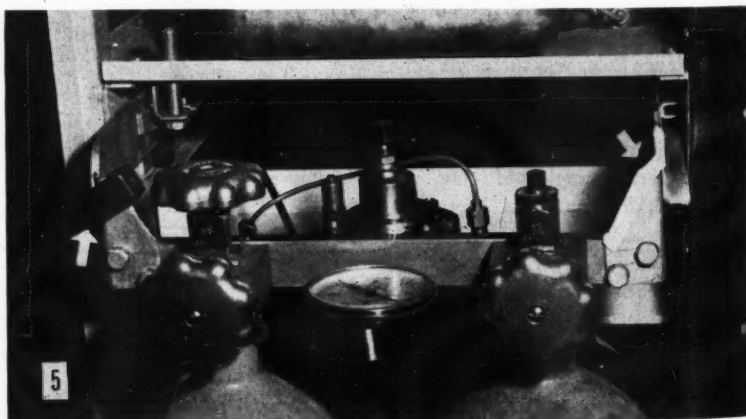
4. Occasionally the cutting abrasive will be deflected suddenly and strike the operator in the face. A protective clear face mask of the type commonly used by certain industrial workers affords protection when this occurs (Fig. 6).

Disadvantages to be Overcome

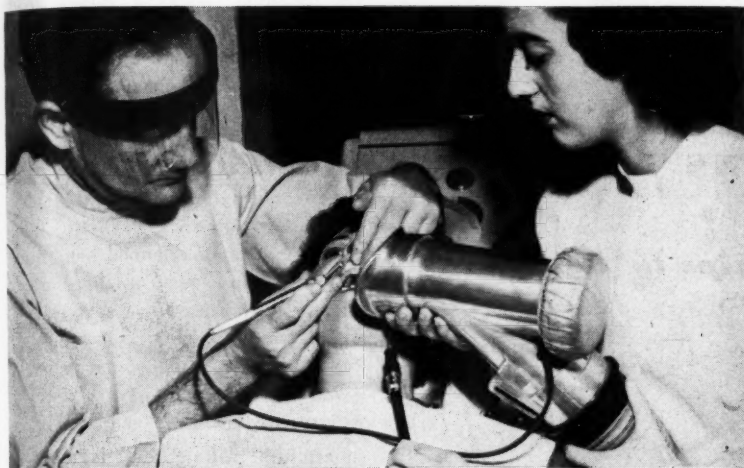
The following are some disadvantages which may be overcome with time and further development:

1. An operator who uses both the straight handpiece and the contra-angle interchangeably and often in the same cavity preparation will find that it is a nuisance to change nozzle tips.

2. An operator who is ambidextrous or who works from either side of the operating chair or both will find it awkward to change rapidly as the suction hood restricts fast change-



5. A rubber x-ray film holder or several thicknesses of adhesive tape placed over the brace will prevent skinned knuckles.



6. Use of protective face mask in airbrasive technique.

over. It is slightly awkward to hold more than one instrument in the mirror hand for the same reason.

3. As the assistant manipulates the suction hood, the auxiliary operating light often shines in the operator's eyes and must be turned off. If the switch were placed on the base of the suction hood it could be quickly turned on and off by the assistant.

4. It seems difficult to arrange a convenient location for the placement of the unit as it is heavy and hard to

move. Handles similar to those on mobile cabinets would be helpful.

Conclusion

The disadvantages described may well be considered minor objections in view of the major advantages which so far outweigh them. With the unit always available, as the operator becomes more dexterous in the technique more uses develop and the limitations become fewer.

510 Goff Building.

Lingual Scrapings During Antibiotic Treatment

PREVIOUS investigation of side-effects of chloramphenicol and aureomycin have shown that changes were more frequent in the oral cavity than in other parts of the body; they consist of dryness of the mouth, throat manifestations, angular stomatitis, and changes in the oral mucous membranes. Striking changes were seen in

the dorsum of the tongue; the commonest was the disappearance of the normal whitish coating with atrophy in the filiform papillae, and in extreme cases, atrophic glossitis with redness and soreness of the tongue.

The present paper¹ describes microscopic examinations of lingual scrapings that were made before, during,

and after treatment with chloramphenicol and aureomycin in 126 patients. In the majority of patients these antibiotics caused the disappearance of the normal bacterial flora and in the remainder the bacteria were diminished. In many patients yeast-like fungi (usually *Candida albicans*) replaced the bacterial flora. The fungi are profuse in hypertrophic glossitis and scanty in the atrophic type. It is suspected that an antagonism exists in the oral cavity between bacterial flora and fungi. The increased number of leukocytes, which is particularly noticeable in atrophic glossitis, is probably a sign of inflammatory reaction to the fungal infection.

Many patients whose tongue had a normal appearance and in whom the bacterial flora was still present had received vitamin B complex simultaneously with the antibiotics. In a few cases, however, acute oral lesions, resembling those of vitamin B deficiency, developed in spite of vitamin treatment. The striking similarity of the oral changes associated with antibiotic therapy to those of vitamin B deficiency has caused some authors to believe that these lesions are signs of vitamin B deficiency, but some factors make this doubtful. Recently it has been suggested that aureomycin and chloramphenicol might exert a blocking action on the intracellular metabolism and thus produce changes resembling those due to vitamin deficiency. At any rate there is evidence that normal bacterial flora is necessary for the healthy structure and function of the mucous membranes.

Adapted from *Journal of the American Medical Association* 148:1253-1254 (April 5) 1952.

¹Tomaszewski, W.: Findings from Lingual Scrapings Taken During Treatment with Chloramphenicol and Aureomycin. *J. Clinical Pathol.* London 4:393-516 (Nov.) 1951.

CHRONIC TENSIONS *in the Skeletal Musculature* and Their Relationships to Dental Disease

BERNARD J. GARN, D.D.S., New York

DIGEST

Although extensive material is available in the dental literature on the anatomy, histology, pathology, bacteriology, nutrition, and other aspects of the mouth and related tissues, investigation into the most vital forces which operate on the oral tissues and structures, that is, the skeletal musculature, would seem to be inadequate. Study of the function of the muscles of mastication, deglutition, articulation, and facial expression (normal or abnormal) in relation to the oral apparatus has been neglected.

The basic assertion of this article is that mental or emotional tension and muscular tension are coexistent and interdependent.

A series of hypotheses are presented concerning the influence of these muscles on the function and health of the mouth and oral tissues. Logical deductions are drawn from the hypotheses. It is obvious that the conclusions drawn will be at variance with some of the accepted concepts of dental disease. It remains for experiment to disprove the validity of the concepts discussed.

Hypothesis One

As a result of psychic tensions, the muscles of mastication, deglutition, articulation, and facial expression assume a state of chronic tension. The resulting imbalance of forces exerts an effect on the tissues of the mouth.

Historic Aspects—The folk literature of all peoples is replete with idioms and folk sayings which postulate the influence of mental states on muscular tensions. "Gnashing of teeth" denotes a physical manifestation of anger; "keeping the chin up" a physical suppression of the impulse to cry.

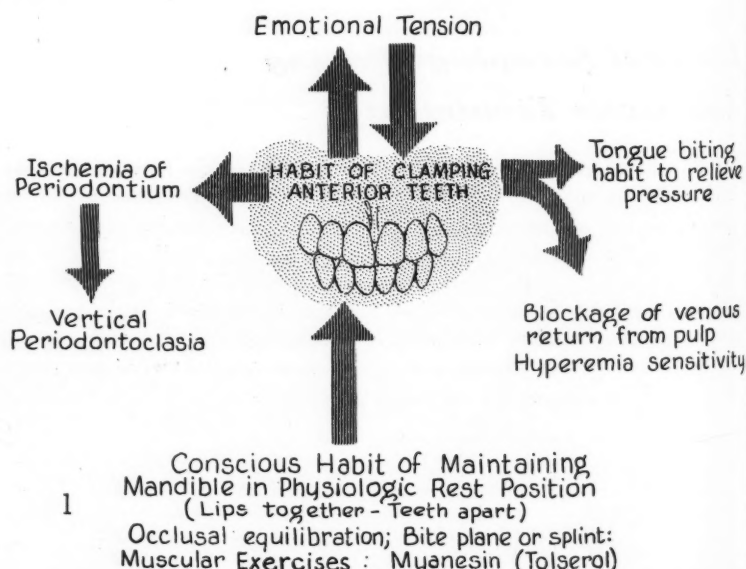
Interpretations of Muscular Tensions—The first example presupposed an abnormal tension of the buccinator, temporal, and pterygoid muscles; the second is related to a similar condition in the orbicularis oris, platysma, digastric, and sternocleidomastoid.

mastoid. "Stiff-necked" is more descriptive of an attitude than of a posture of the neck; and yet the two are always coexistent. The muscles of the mandible are also involved in this syndrome.

Scientific Concept—Darwin¹ placed the concept of the coexistence of emotional and muscular tensions on a more orderly and scientific level than that of folk sayings.

Basic Principle—Modern psychiatry and physiology have developed from an accumulation of specific observations a basic and valid generalization which will, when it has been

¹Darwin, Charles: *The Expressions of the Emotions in Man and Animals*, New York and London, The Appleton Company, 1899.



1. Schematic representation of the factors involved in the development and cure of a typical case of periodontoclasia, wherein the primary cause is chronic muscular tension.

proved and accepted, influence the practice of medicine and dentistry indefinitely. The final synthesis of this concept has been developed by Wilhelm Reich.²

Hypothesis Two

Mental or emotional tensions in the total organism exist only insofar as they have brought about tensions in the musculature.

Corollary 1—Release of the mental tension will produce a release of the physical tension.

Corollary 2—Release of the physical (muscular) tension will produce a release of the mental tension.

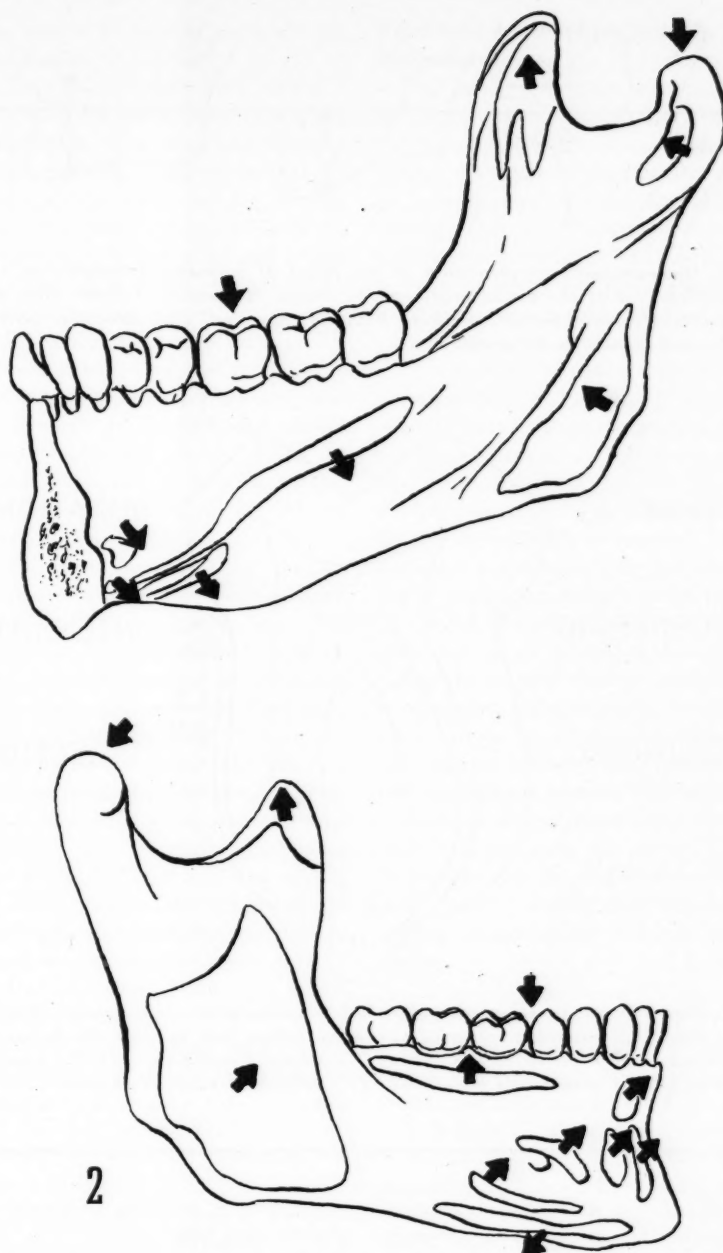
Diverse Methods Reconciled—Like all great truths, this seems almost self-evident, but it has taken the efforts of Freud, Pavlov, and many others to bring it out of the realm of folk knowledge, or instinct, into the region of definite intellectual consciousness.

This truth is recognized as a hypothesis that explains and reconciles such diverse methods as shock therapy, physiotherapy, chiropractic, yoga, faith healing, and many other more or less pragmatic treatments for physical and mental ills.

Dental Applications—A broad field for speculation is opened by the application of this concept to dentistry. The mouth is the most important organ in the psychic consciousness of the infant. Normally, the mouth is strongly associated with the psyche and in cases of abnormal psychologic development it often retains more importance than it should. For this reason, the mouth has, relative to its anatomic size, a preponderance of the most commonly found muscular tensions.

Tensions Assume Several Forms—In the muscles of mastication, deglutition, articulation, and facial expression, tensions may assume several forms:

- (1) A chronic and constant tension (clenching of the jaws).
- (2) An intermittent or rhythmic tension (lip biting).
- (3) Tic (twitching of the orbicularis oris, or a swallowing tic involving



2. Diagram of the mandible showing the muscle attachments, together with vectors indicating the direction of the tensions produced. The head of the condyle acts as a continuous fulcrum and the occlusal plane as an intermittent fulcrum, thus modifying the resultant direction of the forces.

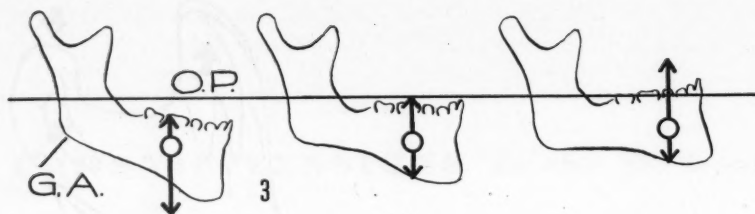
ing the tongue and the depressors of the mandible).

(4) A secondary compensatory tension in the antagonistic muscles resulting, not from a psychic tension, but as an attempt by the body to relieve the primary tension (a tic of the depressors of the mandible may

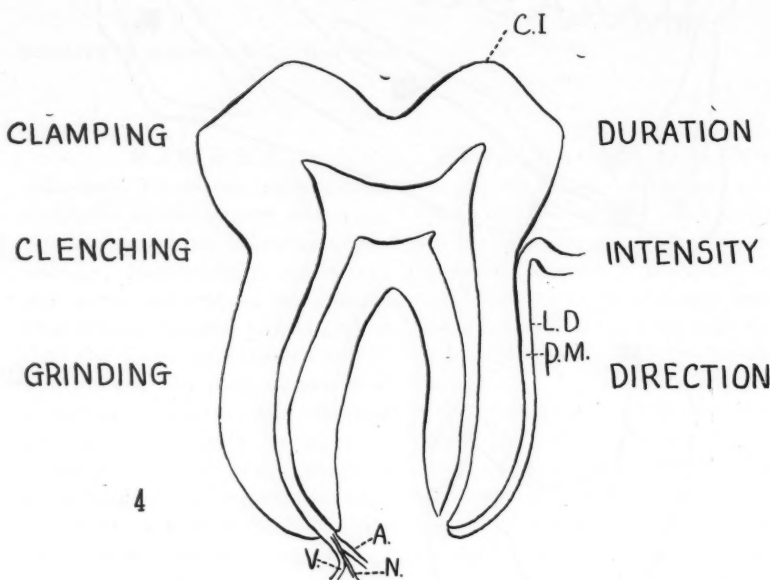
arise as a compensation for a clamping or clenching habit).

Sources of Chronic Tension—Anatomically, any one of the four types of chronic tension may arise in any of the muscle groups involved in the oral structures. The primary tensions, which are usually of the chronic type,

²Reich, Wilhelm: *The Discovery of the Orgone*, ed. 2, New York, Orgone Institute Press, 1948, vol. 1, pp. 234-289.



3. Diagrammatic representation of the effect of muscular disbalance on the development of the gonial angle and/or degree of opening. Vectors show the resultant vertical forces, weighing intensity, duration, and direction. (O.P.) Occlusal plane; (G.A.) gonial angle.



4. Diagrammatic representation of a tooth, showing principle structures affected by clamping, clenching, or grinding habits, taking into account the duration, intensity and direction of the forces. (C.I.) Cuspal inclination; (L.D.) lamina dura; (P.M.) periodontal membrane; (V) vein; (N) nerve; (A) artery.

will arise in a functional group of muscles. The secondary or compensatory tensions, which are often of the intermittent types, will always arise in the antagonists to these muscles.

Hypothesis Three

During the period of growth of the mandible a chronic tension of the elevators of the mandible will produce an acute gonial angle with a resultant orthognathism and/or closed bite.

Corollary—During the period of growth of the mandible a chronic tension of the depressors of the mandible will produce an obtuse gonial

angle with a resulting prognathism and/or open bite.

Effects of Abnormal Habits—The effects of grinding, sucking, lip, cheek, and tongue-biting habits or tics, and abnormal swallowing habits on the developing dental arch are too well known to be enlarged upon here. They are mentioned to emphasize the fact that many previously unrelated bits of knowledge can be coordinated once the validity of the basic concept is accepted.

Hypothesis Four

Chronic tension of the elevators of the mandible, when evident as clench-

ing, will produce an ischemia of the periodontal tissues with a consequent breakdown of these tissues (horizontal periodontoclasia).

Corollary 1—Chronic tension of the elevators of the mandible, when exhibited as clamping, will produce a local ischemia in the tooth involved in the clamping with a consequent breakdown of these tissues (vertical periodontoclasia).

Corollary 2—Chronic tension of the elevators of the mandible, when evident as bruxism or bruxomania, will result in a lateral breakdown of the alveolar bone in those teeth subject to traumatic occlusion and/or abnormal wear or attrition of the occlusal surfaces of these teeth.

Hypothesis Five

Chronic tension of the elevators of the mandible, when evident as clenching or clamping, will produce a pressure on the apical tissues which will prevent the venous return from the pulp while allowing the arterial flow to continue. This will produce a hyperemic pulp, which, with the gingival recession that is always present in these cases, produces sensitive gingival erosions.

Note: In these cases, which are so prevalent and difficult to treat, the patient will almost invariably be of a nervous disposition and will often complain that the sensitivity increases when under tension.

Hypothesis Six

In full denture prosthesis, (1) chronic tension of the muscles of mastication will produce excessive destruction of the alveolar bone; (2) chronic tension of the muscles of deglutition or of the depressors of the mandible will continually displace the lower denture; (3) tic or pressure of the facial musculature will tend to displace both dentures; and (4) abnormal tongue habits will interfere with proper function.

Hypothesis Seven

Chronic clenching, grinding, or clamping will produce degenerative changes in the temporomandibular joint.

Comment

Previously accepted causes of many degenerative conditions of the mouth are important and must be evaluated and treated in each case. The purpose of this discussion is to introduce a new factor, which, it is believed, must be recognized as one of the most important factors in dental disease.

Concept Illustrated—Many dentists have become convinced that bite raising or repositioning of the mandible is desirable in mouth rehabilitation.

Bite Adjustment—The cause of closure of the bite, or opening of the bite has been attributed to missing teeth not replaced and a number of other conditions. Yet most dentists have seen mouths with perhaps two or three remaining antagonistic teeth where the bite has not closed. Mouths have also been seen with a full complement of natural teeth in perfect Class 1 relationship where the bite has closed almost completely.

Properties of Muscular Forces—Closure or opening of the bite and the position of the mandible is a function of the vector resulting from muscular forces acting on the mandible. In analyzing these forces, intensity, direction, and duration must be considered.

Possible Benefits from Bite Raising—If any beneficial results have been obtained by bite raising they may be attributed to the fact that sometimes the act of repositioning the mandible, thereby breaking up neuromuscular patterns, will relieve muscular tensions.

Methods for Eliminating Abnormal Muscular Tensions

The following are some of the methods possible to use for correcting abnormal muscular tensions:

Psychiatric Treatment—Many cases of bruxism, clenching, and clamping have disappeared during analysis without analyst or patient being fully aware of it at the time. This method, however, is not usually desirable, or, fortunately, necessary. It has been shown that the release of tension can be a two-way process and that release of the muscular tension will produce release of the psychic tension. This is

the proper avenue of approach for the dentist.

Establishing Conscious Habit—Probably the most basic step is the inculcation of a conscious habit of "lips together, teeth apart" at all times except when chewing or talking. This places the mandible in the physiologic rest position and brings the muscles of facial expression and deglutition into a more or less normal position. While this habit is conscious, it will direct the attention of the patient to any lapse and help him consciously to discover and combat abnormal habits. As the habit becomes subconscious, it conflicts with the abnormal habits on the subconscious level.

Exercises Helpful—Once the abnormal muscular tensions are discovered and their eradication begun, the patient may help himself by practicing exercises designed to strengthen the antagonistic muscles. For example, in chronic tension of the elevators of the mandible the head is thrown back until the jaw can only be closed by exerting extreme pressure on the depressors. Permitting the jaw to fall open and then closing it in this position strengthens the depressors. This exercise should be done twenty-five times, twice daily.

Use of Splints—Temporary plastic splints are helpful by breaking up the habitual neuromuscular patterns and permitting the establishment of new ones more compatible with the health of the oral tissues. Occlusal equilibration is beneficial, principally for this reason too.

Drug Produces Relaxation—Mephensin (tolserol; myanesin), a new drug which produces relaxation of the musculature, promises to be a potent factor in correcting chronic tensions and relieving muscular imbalance. Although the drug acts by paralyzing certain neural pathways in the spinal cord, and has absolutely no direct action on the cerebral cortex, it is now being used extensively to combat such conditions as "anxiety" and "fear." This is physiologic proof of the basic assertion of this article; namely, that mental (emotional) tension and muscular tension are coexistent and interdependent.

Further Investigation Required

This article can only serve as a preliminary survey in this field. Further investigation is required to prove present assertions and to extend present knowledge of the subject. Besides clinical study and treatment, statistical studies correlating gnathodynamometer readings and cephalometric recordings are needed to provide some measurable constants.

Preoccupation of Brain with Muscle—Sherrington³ stated, "I may seem to stress the preoccupation of the brain with muscle. Can we stress too much that preoccupation when any path we trace in the brain leads directly or indirectly to muscle? The brain seems a thoroughfare for nerve action passing on its way to the motor animal. It has been remarked that life's aim is an act not a thought. Today the dictum must be modified to admit that often, to refrain from an act is no less an act than to commit one, because inhibition is co-equally with excitation a nervous activity."

Study of Brain, Nerves, and Muscles—It is the brain, the nerves, and the muscles that the dental profession must study for further understanding of the oral mechanism in health and disease.

Summary

1. Psychiatry has established the coexistence and interdependence of mental and muscular tensions.

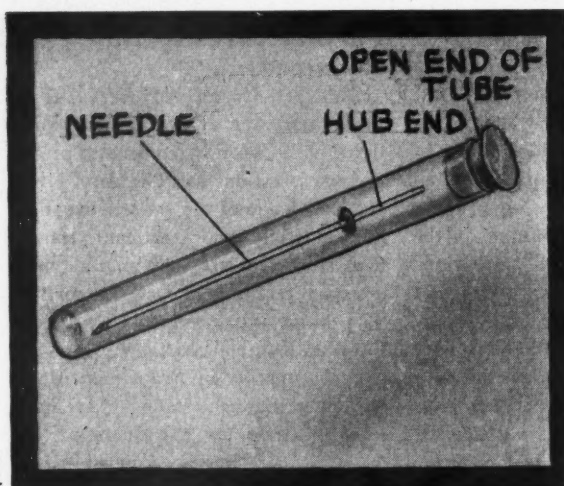
2. Because of its primary position in relation to the psyche, the oral apparatus must necessarily become involved in many chronic tensions which lead to an imbalance of the muscles of mastication, deglutition, articulation, and facial expression.

3. An attempt is made to demonstrate that such imbalance might logically be a necessary and sufficient etiologic agent for many types of dental disease.

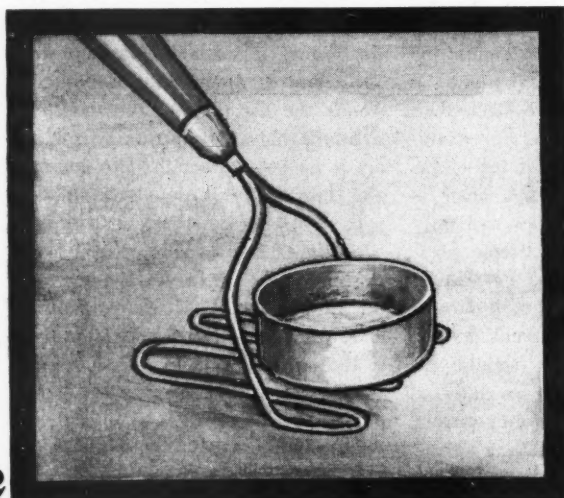
4. Several methods of combating this imbalance and thus removing the cause of disease are discussed.

57 West 57th Street.

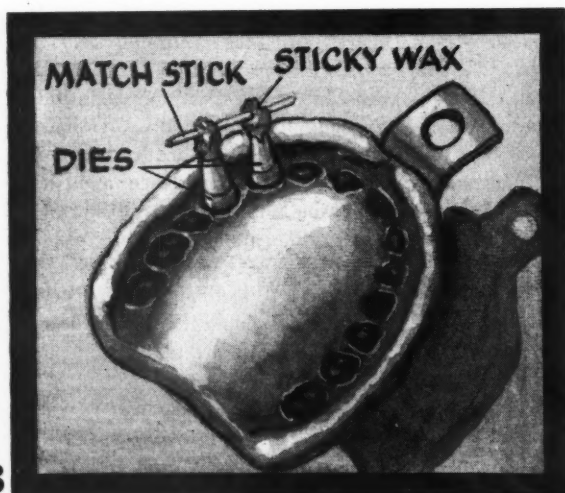
³Sherrington, Sir Charles: *The Brain and Its Mechanism*, Cambridge, England, Cambridge University Press, 1937.



1



2



3

Clinical and Laboratory

Sterilizing Injection Needles

Irving S. Vogel, D.D.S., Tonawanda, N.Y.

1. After injection the needle is washed and placed in an empty anesthetic tube, hub end toward the open end of the tube. The rubber cap, needle, and tube are boiled. The cap is replaced. When ready for use the needle may be slid directly into the opening of the syringe without being touched to break the chain of asepsis.

An Efficient Flask Holder

J. F. French, D.D.S., Ottawa, Ontario, Canada

2. An inexpensive wire potato masher with handle bent to an angle of 45 degrees will serve to hold flasks during wax elimination.

Stabilizing Dies in Hydrocolloid Impressions

Gaspar A. Oliveri, D.D.S., Brooklyn, N.Y.

3. To prevent dies from shifting after they have been set in hydrocolloid or alginate impressions, attach a matchstick or toothpick across the end of the dies, using sticky wax.

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For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay \$10.00 on publication.

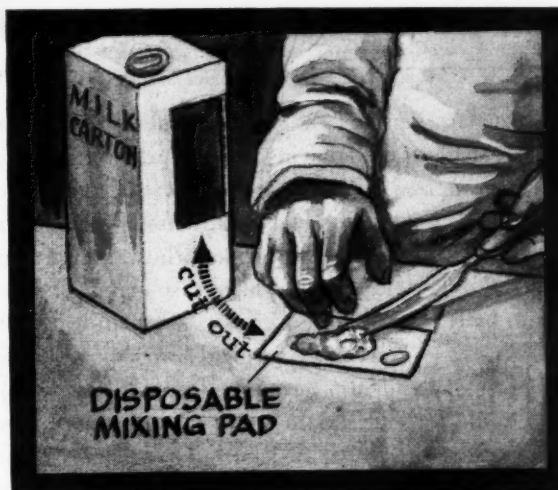
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

Disposable Mixing Pad

Ben E. Pleshette, D.D.S., New York

4. Wash out a wax paper milk container and cut a piece of suitable size. The inside surface may be used to mix zinc oxide-eugenol preparations.

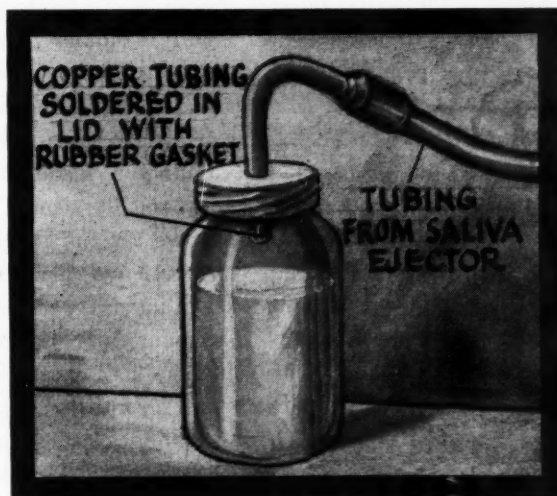


4

Bubble-free Investment, Plaster, or Stone

William L. Levy, D.D.S., Fall River, Mass.

5. Select a glass jar with a metal top and a rubber seal. Drill a hole in the cap and attach a piece of quarter inch copper tubing with soft solder. Allow one-quarter inch of the metal tubing to remain inside the cap and one and three-quarter inches to project outside. Mix the material (stone, plaster, investment) in a rubber bowl. Then pour the mixture into the jar. Attach the saliva ejector tube to the copper pipe. The vacuum will be sufficient to remove all air bubbles.

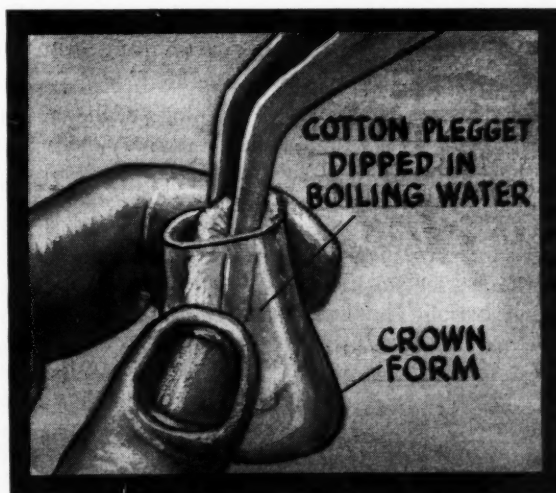


5

Adapting Crown Forms

S. S. Pollak, D.D.S., New York

6. Plastic crown forms are easily damaged while trimming them. Dip a pledget of cotton in boiling water and apply inside the crown form. When the crown form is softened in this manner it is easy to cut and contour for fit.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 280 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S Page

THAT THE dentin is a "vital" tissue is a fact that has often escaped us in clinical practice. It is a living internal tissue of the body with vital functions. We have often abused this tissue during surgery by generating unnecessary heat and by inflicting other trauma. We have also erred on occasion by removing more of this tissue than was indicated by conservative surgical procedures. That disease of the dentin may be a focus of infection is a possibility that should not escape our considerations. The dentin is in connection with the blood stream and with the central nervous system. The dramatic photomicrographs by Manley and Brain¹ showing the protoplasmic extensions of the odontoblasts in the dental tubules and the tissue fluids in the tubules should convince us of this biologic fact. The same principle is expressed by Hoskins and Bevelander:² "In the calcification of dentin Tomes' dentinal fibrils do not calcify. They are essentially protoplasmic processes, maintaining a metabolic pathway between the pulp cavity and the dentin."

Every clinician is aware that the carious attack of the dentin is a disease process, and like all pathologic phenomena, it varies in intensity. Caries may be acute or slow, "malignant" or benign, "light" or "dark." Every clinician has observed caries that attacked swiftly where no apparent defense mechanism was at work. In other cases lesions have been present for years without tissue loss. It is unlikely that caries is always a continuous process. Similar to other forms of disease, it is correct to assume that there may be episodes of disease intensity and other episodes of disease arrest. We have been so concerned with the prevention and treatment of the carious lesion that we have not given enough attention to the biology of the carious process.

The following is a report from the *British Dental Journal*:³

"E. W. Bradford of Sheffield Dental School demonstrated some of the reactions of the odontoblasts to irritation. He showed that the main reaction of the odontoblasts to caries is an attempted closure

of the 'dentinal tubule.' This process has been termed sclerosis. As far as could be determined no photographic evidence of what actually occurs in the dentinal tubule has been published, and the purpose of the demonstration was to present such evidence. Carious teeth were embedded in acrylic resin by the technique which consists of dehydration of the tissue through the alcohols, impregnation with pure methacrylate monomer, and polymerization of the monomer in an incubator at 37 degrees Centigrade for forty-eight hours using benzoyl peroxide as the catalyst. The ground transverse sections of the dentin from this material showed what has long been known clinically, that caries of dentin takes two forms depending upon the individual. The difference in the histologic appearance of the two types lay in the degree of sclerosis of the dentin. Slow caries produces a decalcification of the surface and a gradual proteolysis due to the effective barrier formed by the completely sclerotic dentin to the invasion of the tissue by organisms. Rapid caries occurs where incomplete sclerosis leaves protoplasmic portions of the odontoblasts within the dentin, which on death leave a pathway for the invading bacteria. These cause decalcification and proteolysis of the surrounding dentin matrix producing vacuolation and splitting of the tissue. In the actual process of sclerosis, the odontoblast may be likened to an ameba with a long pseudopodium passing into the dentin. With irritation, this pseudopodium is withdrawn until it ceases to be irritated. During this process a substance is laid down, similar to that occurring in the translucent area, which occupies the space originally occupied by the dentinal process of the odontoblast."

The concept of a sclerosive process is sound from clinical experience. "Soft" dentin, light and leathery, is usually associated with rapid or acute caries. "Hard" dentin, dark and firm, is a good example of a sclerosive defense reaction to carious attack. These two general forms of dentinal disease should not be treated by the same clinical procedures. The "malignant" postadolescent caries, for example, is a different biologic entity from the slow dark caries of later life. The operative treatment for the two should likewise differ.

¹Manley, Edgar R., and Brain, Edward B.: An Atlas of Dental Histology, Oxford, England, Blackwell Publications, 1947, p. 8.

²Hoskins, Margaret, and Bevelander, Gerrit: Dental Histology and Embryology in Outline of Histology, ed. 2, St. Louis, The C. V. Mosby Company, 1948, p. 29.

³Bradford, E. W.: Reactions of Dentin to Caries, Br. D. J. 92:154 (March) 1952.

NUTRITION in Geriatrics

E. J. STIEGLITZ, M.D., Washington, D.C.

Factors Affecting Absorption and Transportation of Foods

Certain changes in the alimentary canal and its ancillary structures are significant in the problems of nutrition in later years: (1) Loss of teeth interferes with proper mastication; an inability to chew properly may so reduce the tolerance to certain types of foods that important items are deleted from the dietary. (2) Frequently it is possible to correct so-called irritable bowel by insistence on proper dentures. (3) Because of painful or missing teeth, older persons frequently choose only the softer foods.

Secretions Diminish—The actual volume of all the alimentary secretions is lessened. Considerable interference with the digestion of foods is to be anticipated. Chronic cholecystitis interferes with the utilization of fats. Unless the diet be fortified with the fat-soluble vitamins from sources other than the natural fats, a deficiency due to spontaneous avoidance of fatty foods is not at all unusual.

Diminished Vascularity—Atrophy of the alimentary mucosa with diminished vascularity makes the senile bowel more vulnerable to trauma and may impede absorption. Because of interference with absorption it is often desirable to prescribe larger quantities of specific food substances indicated to replace deficiencies than would be theoretically necessary.

Circulatory Changes—Cardiac inefficiency with resultant hypostasis reduces the supply of oxygen to the tissue cells and interferes with the removal of metabolic debris. Oxygen inadequacy may be regarded as a special type of nutritional deficiency. Arteriosclerotic changes roughly parallel advancing age, but arteriosclerosis may

occur in persons as young as 35 to 40. Age per se is a contribution and not the primary factor in the development of arteriosclerosis.

Nutritional Factors in Arteriosclerosis—The concept that a liberal protein intake contributed to this disorder is no longer valid. Eskimos living almost solely on animal tissue and therefore on a high protein diet do not show any increased incidence of either renal or vascular disease. Fat has been considered a potential cause of arteriosclerotic change but this has not as yet been established in man by controlled observations.

Interference with Cellular Nutrition—Hypertensive arterial disease interferes most decidedly with the nutrition of the tissue cells. It must be emphasized that distal to arteriolar constriction the circulation is impaired. Capillary stasis creates local impairment of nutrition and the oxygen supply. Diminished capillary permeability may add to impaired renal efficiency in enhancing accumulation of detrimental metabolic debris in the tissue interstices.

Liberal Water Intake Necessary—It is more work for the kidneys to secrete a small volume of highly concentrated urine than a larger volume of dilute urine. The chronically impaired kidney of later maturity requires a larger fluid intake and therefore larger urinary output in order to eliminate the metabolic debris adequately.

Metabolic Factors—It is well known that the internal milieu of the organism remains nearly constant throughout the life span and the ranges of almost all the so-called physiologic constants, such as temperature, pulse rate, concentrations in the blood of glucose, protein, calcium, and the like are

about the same at age 80 as at 8. Nevertheless the ability to maintain such constancy depreciates with advancing age.

Tolerance Reduced—The curve obtained in the glucose tolerance procedure in older persons frequently resembles that seen in younger diabetic patients. The aging person does not respond well to a rapid absorption of glucose. He does not tolerate a lowered blood sugar content whether the result of starvation or of hyperinsulinism. Glucose is a major source of cardiac energy.

Alkali Excess—With aging there develops an increasing inability to handle excesses of alkali; excesses of acids are more efficiently disposed of because the normal physiologic mechanisms of the organism are prepared for the riddance from the body of acid substances. The ill consequences of hypoproteinemia in causing edema, poor wound healing, retarded bone healing, decreased resistance to generalized infection are much more marked in older persons.

Decline in Caloric Utilization—In man, the basal metabolic rate appears to diminish with age. It still remains to be demonstrated whether this decline in caloric utilization and oxygen consumption with advancing age is necessarily desirable.

From the clinical point of view, the fact that the basal rate does decline with age and that this diminution is of considerable magnitude is important, because the older person needs fewer calories even if continuing to be active.

Impaired Uric Acid Metabolism—Thus far there have not been developed any generally applicable clinical tests for measuring the ability of the organism to handle known amounts of purines. But when a clinical test procedure is developed, we may anticipate observations indicating a gradual decline in ability to utilize purines without accumulation of uric acid with advancing age. Acute episodes of gout are precipitated by less and less noteworthy indiscretions as the gouty patient ages.

Variations in Mineral Metabolism—Loss of calcium and phosphorus as

a result of alimentary disturbances in the aged apparently are factors in the characteristic atrophy of bone seen in the senile person. It is stated that one of the most common causes of inadequate utilization of ingested calcium is lowered gastric acidity and hepatic and pancreatic insufficiency. The immediate result of these deficiencies is reduced fat absorption with the inability to absorb the fat-soluble vitamin D essential for the absorption and utilization of ingested calcium.

Habits: Dietary habits are affected by many elements: (1) Because of ease of preparation the elderly are prone to rely on packaged foods, particularly on bakery goods. (2) The tendency of older persons is to eat excessive amounts of carbohydrate and insufficient protein. (3) The ease with which food is consumed plays a role in selection of the diet of an older person. Inadequate dentures tend to limit the diet to softer foods.

Psychologic Factors: Anxieties, especially if long continued and habitual, may lead either to a serious anorexia or to excessive consumption of foods, with obesity as a consequence. Anorexia is not uncommon when "the will to live" is weakened by long distressing illness and disablement. Considerable food can be introduced in the beverage form if the appetite is extremely poor. Liberal amounts of the vitamin B complex may be given in an attempt to encourage the appetite.

Overeating—Anxiety or discontent is at the back of most instances of overeating. Eating may be an escape mechanism. Few obese senescents survive to become senile.

Abrupt Habit Changes Unwise—Unwise habits can be modified slowly, but sudden and radical changes in the mode of life are physically upsetting as well as emotionally disturbing. If the advice regarding dietary habits is too restricted or too much at variance with the established mode of life, the patient will not follow the therapeutic suggestions and nothing whatever is accomplished.

Specific Nutritional Needs

By grouping the important nutri-

tional elements, the discussion of specific nutritional needs may be facilitated and clarified.

Water—The habit of ignoring water as an element of diet is to be deplored. Of the total weight of the human body, some 70 per cent is water. The intracellular water is about 50 per cent of the total body weight and the extracellular fluid about 20 per cent. Though the over-all volume of this fluid is relatively constant, water is being utilized in various ways.

Dehydration Deleterious: Even relative dehydration can have profoundly deleterious consequences. Excessive ingestion of water is rare. The ability of the organism to eliminate excesses of water is far greater than its ability to conserve fluids even when an adequate intake occurs.

Fluid Intake May be Spaced: In the older person it may be desirable that the fluid intake be spaced, with small amounts taken at relatively frequent intervals rather than large quantities at any one time. This method causes less strain on the absorptive mechanism of the intestinal canal and on the circulatory distribution of the fluid. Persons who are bothered with nocturia should avoid consuming the major portion of their fluids in the latter part of the day.

Forms of Fluids: Many older persons complain that they do not like water. It is feasible for them to consume flavored beverages, ginger ale, tea, either hot or cold; coffee, soups, fruit juices.

Fluid in Edema: Radical restriction of water to a minimum in edema is not justified. Edema fluid is toxic. Edema will accumulate whether water be ingested or not. During the subsidence of edema it is important to cover this diuresis with an adequate water intake. Many times the cardiac invalid is more severely ill and in greater jeopardy during the subsidence of anasarca than during its accumulation.

Addition of Sodium Chloride: In extremely hot weather not only is an increased amount of water a necessity but also additional intake of sodium chloride. Additional salt should be given at meals and not as a separate item. The studies of the Army indicate

that approximately 12 grams of salt are required for those in hot climates working at sedentary occupations.

Calories—The detrimental effects of obesity in the later years of life can hardly be overestimated: 1. Extensive actuarial studies of the effects of abnormal weight on expected mortality in persons otherwise normal reveal that those 15 to 25 per cent overweight present a mortality of 144 per cent of that expected, and those 25 per cent or more overweight show a mortality of 174 per cent of the expected rate. 2. If the death rate of cardiovascular patients of normal weight is taken as 100 per cent the mortality rate for those overweight is found to be 162 per cent of normal, whereas for those underweight the death rate is only 77 per cent. 3. The mortality from diabetes mellitus in the presence of obesity is increased to 250 per cent over that which occurs in those of normal weight.

Obesity: The control of obesity involves two points of attack: (1) Prescription of a dietary with sufficient calories to maintain vigor and activity but less than that which is required to maintain the excessive weight. (2) The control of appetite so that this diet may be followed for sufficient time to permit of reduction to normal weight.

Adjustment of Diet: The major restrictions in calories should be in carbohydrates and fats. Proteins should not be limited and are often best increased. Exploration of the psychologic factors responsible for the excessive appetite is an important factor in the treatment of obesity. The indiscriminate prescription of thyroid preparations is unwise and has resulted in unnecessary injury. Not infrequently the administration of thyroid increases the appetite excessively, thus making weight reduction more difficult.

Gradual Weight Reduction: In the second forty years of life it is essential that weight reduction be gradual. A weight loss of approximately a pound a week is as rapid as is usually advisable. The reasons for insisting on a gradual, long term program of weight reduction are several: 1. Rapid

weight losses are usually quickly regained because patients do not change their habits of eating. Gradual weight reduction permits the development of new eating habits. 2. With slow but persistent reduction the patient does not complain of a sense of weakness or exhaustion. 3. Wrinkling of the skin is avoided by slow slimming. This is important to middle aged and elderly alike.

Proteins—Inadequacy of protein is a significant factor in the pathogenesis of tissue wastage, anemia, and edema. Mild deficiencies may be manifested primarily by a sense of habitual fatigue. Plasma protein determinations on blood from older persons frequently reveal a moderate degree of insufficiency. It is not difficult to determine the degree of protein deficiency of the serum protein concentration. If the deficit is to be restored it is necessary that a total ingestion of something over 2,000 grams of protein be added to the usual daily requirement of 1 gram per kilogram per day. (A kilogram equals 2.2 pounds.) These 2 kilograms of additional protein may be spread over as many days as is deemed advisable in making up the deficiency.

Milk a Source of Protein: Milk is also a major source of calcium. Skim milk may be preferable to whole milk as a source of extra protein if it is desirable to avoid increasing the fat intake. Dried skim milk preparations are of considerable value in the maintenance of good nutrition in the senile person.

Other Significant Sources of Protein: Cheese and lean meats, and nuts, although they are poorly tolerated by the majority of older persons, are excellent sources of protein. The value of eggs in the dietary of the older person is open to question at the present because of the controversy concerning the hazards of cholesterol ingestion.

Nutrition in Surgical Emergencies: The role of nutrition and particularly of protein adequacy in the preoperative and postoperative care of the elderly is extremely important. In acute surgical emergencies intravenous administration of hydrolyzed amino acids is entirely justified but

in the long term nutritional problem of depletion in older persons, protein hydrolysates are largely unnecessary. The usual protein foods, such as milk products, can be employed to maintain adequate protein intake.

Carbohydrates—Adequate carbohydrates to balance the diet and, of course, appropriate restrictions for the diabetic patient are in order.

Fats—The controversy as to whether arteriosclerosis and fatty degeneration of the liver are due in any respect to a diet excessively rich in fats and cholesterol is still unsettled. The nutritional role of cholesterol in the genesis of human atherosclerosis is of doubtful significance. There is, however, no doubt that there exists a relationship between obesity and the incidence and severity of atherosclerosis.

Minerals—Most of the minerals required by the body are available in ample quantities. However, both calcium and iron are frequently deficient.

Source of Calcium: The major sources of calcium are milk, cheese, ice cream, green vegetables, and legumes. It may require a considerable period to restore calcium balance in older patients who have been gradually depleting their reserves over many years. The patient should be made aware of the inevitable slowness of correcting long-standing deficiencies.

Iron Requirements: The recommended allowance of iron for an adult is approximately 12 milligrams per day. Habitual intakes below this level are extremely common. Moderate anemias are almost the rule in elderly persons; clinical experience reveals that a great majority of them require supplemental administration of iron salts of one form or another.

Vitamins—Low grades or minor degrees of vitamin deficiency can be assumed to be the rule rather than the exception. It has been shown that liberal additions of the vitamin B group and ascorbic acid to the dietary of older persons can make for great improvement in general vitality and vigor.

General Inadequacy: In most instances of vitamin deficiency states in elderly persons there exists a general

inadequacy other than insufficiency of any one element. The importance of folic acid as well as iron in the maintenance of an adequate hemoglobin content in elderly patients must not be forgotten.

Supplementation: Because of difficulties in absorption and utilization, it is felt that the usual normal intake for an adult can well be doubled for those in later maturity or in actual senility. The balance between the various vitamins should be preserved at approximately the usually recommended level.

Bulk—The senile intestinal mucosa does not tolerate roughage. The roughage from bran and the scratchy fibers of items such as celery and hulls of corn must be distinguished from soft bulk.

Sources: Major vegetable sources of soft bulk are the roots, such as beets, turnips, parsnips, carrots; and the leaves, such as spinach, lettuce, cauliflower, brussels sprouts, and broccoli. The seeds, peas, and beans offer little bulk although their nutrient value is unquestioned.

Individualization Necessary: Control of the bulk in the diet, as well as in all other aspects of nutrition, must be highly individualized in geriatric nutrition.

Accessories—Excesses of condiments and spices, particularly those which are prone to burn the tongue, such as pepper, mustard, and horseradish, are undesirable for aged persons because (1) they are irritating to the intestinal tract, and (2) they contribute to vascular and renal irritation.

Coffee: The importance of an adequate fluid intake has been emphasized. Coffee and tea are not contraindicated except in specific illnesses or idiosyncrasies. Recent studies indicate that the administration of coffee throughout the life span of experimental animals has no ill effect whatsoever.

Stimulation Often Valuable: Frequently, the desirable morning diuresis and stimulation of caffeine is highly profitable. When insomnia is a problem, caffeine in any form late in

(Continued on page 284)



Appendicitis and Cancer

The possible association of appendicitis and cancer is commoner than is generally appreciated. Most surgeons and pathologists recognize this today. This recognition is important in the younger and middle age groups.

Primary or secondary carcinoma in the appendix may produce acute appendicitis by obstructing the lumen, by obstructing lymphatics or blood vessel, or both, or by infiltrating the wall. In such cases there is a danger of failure to recognize the basic disorder.

There is a large group of cases in which primary carcinoma of the cecum produces symptoms and signs clinically indistinguishable from those of acute appendicitis. The danger of unrecognized carcinoma is great in this group.

The relationship between appendicitis and cancer may be one of the following: (1) primary carcinoma of the appendix producing acute appendicitis, (2) metastatic carcinoma from a distant organ producing acute appendicitis, (3) primary carcinoma of the cecum producing acute appendicitis, or (4) primary carcinoma of the cecum producing clinical signs simulating acute appendicitis.

Primary carcinoma of the appendix is rare. However, it is often associated with the symptoms of appendicitis. The condition should therefore be verified or ruled out in all cases. Metastases to the appendix may occur in patients suffering from carcinoma-tosis peritonei. In such instances the irritation of the appendix is a component of the clinical picture of general peritoneal irritation involving other areas as well.

There are some cases where primary carcinoma produces acute appendicitis. Detection of these is mandatory. About 25 per cent of patients with carcinoma of the cecum present signs of acute appendicitis. The intricate anatomic relationship between appendix and cecum predisposes to easy involvement of the appendix by a carcinoma originating in the cecum.

MEDICINE

and the Biologic Sciences



Likewise, the clinical manifestations of carcinoma arising in the cecum may be easily misinterpreted as acute appendicitis.

Simple appendectomy is not adequate treatment for carcinoma of the appendix or cecum. Many of these lesions are resectable and curable at the initial illness. The possibility of a dual lesion must always be kept in mind. Awareness of the possibility, especially in relatively young persons of either sex, should reduce the incidence of unrecognized cecal carcinoma.

Costello, Cyril, and Saxton, John: Appendicitis and Cancer, Postgrad. Med. 9:482-486 (June) 1951.



ACTH— Administration

ACTH and cortisone therapy has developed into quite a specialized field during the last two years. Experience has shown that there are some important points which should be of interest.

ACTH administered by injection simply stimulates the patient's own adrenal gland to make cortisone and cortisone-like substances. Therefore,

the toxic and therapeutic effects of cortisone and ACTH may be considered together.

(1) In general, cortisone makes the patient retain both water and sodium. If there is any tendency to cardiac decompensation and rheumatic fever, edema is likely to occur. Every patient receiving these drugs for more than two weeks should have a low sodium diet. No salt should be used in the kitchen and there should be no salt shaker at the table. The total common salt should be less than 2 grams per day.

(2) Cortisone will promote the release of potassium in the urine. Potassium is the major electrolyte of the cationic group in muscle. The syndrome of potassium insufficiency comprises muscular weakness, abdominal pain, and electrocardiographic abnormalities. It is more difficult to pull a patient out of potassium insufficiency than to prevent it. If therapy is to last more than two weeks it is wise to give 3 grams of additional potassium per day.

A short term course of therapy does not require the precautions necessary for long term therapy. Short term therapy includes use of ACTH or systemic cortisone for less than two weeks in treating an acute iritis or in taking care of a disease whose nature is self-limited. Long term therapy includes use of the drug for rheumatoid arthritis or in cases of acute illnesses, such as lupus erythematosus.

(3) ACTH produces certain toxic effects which are not as common or as severe when cortisone is used. One of the most important of these effects is psychologic. It is not possible to determine in advance which patient will experience serious mental disturbance. Some experience a euphoria; everything is funny. Others experience a mild depression. And some experience a psychosis. This is always an indication to stop the ACTH. Usually the psychosis disappears within a week or so.

The types of diseases for which ACTH and cortisone are most effective are those in which the inflammation has an allergic base and a self-limited or cyclical course. Rheumatic

fever is the outstanding example of this. With these drugs the incidence of later crippling cardiac lesions may be largely eliminated.

Some degree of relapse may be expected in diseases that naturally run chronic courses when the administration of the drug is stopped. Patients receiving ACTH and cortisone should be free of coexisting infection. This can create a serious problem, especially in the abdomen. The body loses its inflammatory response in the peritoneum and the usual symptoms and signs are much diminished.

Diabetes sometimes occurs during a course of therapy. This should be treated as ordinary diabetes. Usually this condition will subside when the treatment is stopped.

At the present time it is necessary that ACTH be given three or four (preferably four) times a day. Cortisone, on the other hand, is administered only once a day. It is hoped that a better long-acting ACTH product may be developed soon.

Armstrong, S. Howard: Case Selection and Practical Points on the Administration of ACTH, Postgrad. Med. 10:1-5 (July) 1951.



Trichinosis Control

Trichinosis is far more common than is ordinarily believed. In one series of 500 unselected consecutive autopsies performed on county hospital patients in the Detroit area, 93 positive cases of infestation with *Trichinella spiralis* were found. There was an increasing frequency of infestation in successive decades from the fourth to the eighth inclusive. The striking fact was that in not one of these patients was the diagnosis recognized clinically. A few of these persons had reported rheumatic symptoms.

Only recently another series of studies conducted in Cleveland revealed the incidence to be as high as 36 per cent.

Trichina infestation comes primarily from eating trichinous pork. The

hog becomes infected from eating scraps of uncooked trichinous pork present in garbage. About one and a half per cent of hogs slaughtered are found to be infested.

In any given year nearly 90 million hogs are slaughtered in the United States. Much of the material is eaten here. The remainder is exported. Each American who eats pork consumes about three servings of trichinous pork each year.

Little progress has been made in the United States toward control of trichinosis. Approximately 70 per cent of American pork is prepared in plants under governmental inspection. However, this does not necessarily prove that the meat is free from living trichinae. A large part of the total American pork supply is open to the danger of carrying living parasites. The consumer may eat pork that has been placed in such products as frankfurters, hamburgers, sausages, meat loaf, and chop suey. If these have been insufficiently cooked or processed, the risk of trichinosis is apparent.

Sterner controls are necessary. In the United States 14,000 hogs per million are found to have trichinosis as compared to only seven hogs per million in Copenhagen. Measures advocated for the control include: (1) destruction of rats, (2) elimination of garbage and of infected material from the feed of hogs, (3) cooking of all garbage fed to hogs, (4) microscopic inspection of pork, (5) proper processing of all pork products which might be eaten without cooking, and (6) a campaign of education.

Temperatures of -16.0 degrees Fahrenheit maintained for thirty-six hours or -34.6 degrees Fahrenheit maintained for two minutes are effective in killing all trichina larvae. More studies are needed in the possibility of quick freezing, cooking, and other methods of eliminating the trichina hazard. Once the condition has largely been eliminated the conditions of control need not be quite so severe.

Editorial: Trichinosis, Postgrad. Med. 9:541-542 (June) 1951.



Sedimentation Rate and Age

The erythrocyte sedimentation rate is accepted as a valuable laboratory aid. It is simple yet has reliable accuracy. It has a high test-retest reproducibility and its interpretations have been fairly well standardized.

It is generally accepted that a normal person will have a "normal" erythrocyte sedimentation rate. The actual numerical value depends on the particular type of test used. Most clinicians agree that there is a slight elevation of the sedimentation rate in the aged.

Females have a sedimentation rate in the order of 5 millimeters per hour more than that of males. There is no evidence that this differential significantly changes in increasing age groups.

The mean sedimentation rate tends to rise consistently with age until the ninth decade of life when there is a slight decrease. For normal young adults the upper limit of normal is established at about 20 millimeters per hour. For the elderly the upper limit of normal is established at about 35-40 millimeters per hour. The sedimentation rate in the elderly person who is in good health is about 10 millimeters per hour more than that of a young adult.

Wilhelm, Warren F., and Tillisch, Jan H.: Relation of Sedimentation Rate to Age, M. Clin. North America 35:1209-1211 (July) 1951.



Hemoptysis—Significance

Serious pulmonary disease must be suspected in the majority of patients with hemoptysis. A complete and thorough study of these cases is mandatory in order to establish a diagnosis. The examination should include a roentgenograph and bronchoscope examination of the chest, including bronchography whenever indicated.

The possibility of a bronchogenic

carcinoma should always be thought of first in patients of the middle age group with hemoptysis. The commonest causes of hemoptysis in adults between twenty and forty years of age in order of frequency, are pulmonary tuberculosis, bronchiectasis, and mitral stenosis. In adults between the ages of forty and sixty the causes in order of frequency are bronchogenic carcinoma, pulmonary tuberculosis, and bronchiectasis.

Rarely is hemoptysis disregarded by the patient. Usually a patient will consult a physician for this complaint before any other symptoms that may manifest themselves. Many patients experience marked manifestations for many months before seeking medical advice. However, the moment a patient sees the presence of blood in the sputum he becomes greatly concerned and seeks medical advice.

Hemoptysis is present in about twenty-five per cent of patients with pulmonary tuberculosis. Too frequently many young people feeling perfectly well will report the presence of blood when clearing the throat. They are told that the source of the bleeding arises somewhere in the mouth, nose, or throat or at the root of the tongue. With this state of false security they return to their normal routine only to break down again in a few months with either moderate or far advanced pulmonary tuberculosis. "The occurrence of definite hemoptysis in a young adult should invariably be regarded as evidence of tuberculosis unless it can definitely be shown to be due to some other cause."

The occurrence of hemoptysis in a person past middle age should always arouse the suspicion of the possibility of an existing bronchogenic carcinoma in the patient. Bloody sputum which persists day after day for weeks is almost always from carcinoma and not from tuberculosis or other disease.

It is interesting to note that about fifteen per cent of patients with rheumatic heart disease give a history of hemoptysis. The symptoms associated with hemoptysis are shortness of breath, palpitation and precordial distress. The clinical course and prognosis is much poorer in these patients

with hemoptysis than in the case of rheumatic heart disease in which there is no bleeding.

There is a small group of patients where the cause of hemoptysis cannot be determined. The prognosis is usually excellent even though the hemorrhages are prone to recur over a period of years and at times they may be quite profuse. These cases should be under supervision and checkups made from time to time so that no serious lesion such as bronchogenic carcinoma is missed.

Levitt, Nathan: *Clinical Significance of Hemoptysis*, J. Michigan M. Soc. 50:606-610 (June) 1951.



Vitamins in Citrus Products

Citrus fruits have assumed a most important role in the human diet. There is considerable information concerning the thiamin, niacin, pantothenic acid, carotene, and ascorbic acid content of citrus fruits and juices. However, only scattered data are available relative to the biotin, pyridoxine, folic acid, and inositol content of citrus products. The effects of processing and storage on the latter group of vitamins are not too well known.

All investigations for these vitamins confront the problem of obtaining a representative sample of a natural product. There is great variation in the vitamin content within any species or even a variety of a species of a natural product. The vitamin C content of the fruit is lowest when determined on samples collected late in the packing season.

From a carefully controlled series of studies on samples from a pooled composite sample representing a large number of boxes of citrus fruit in 17 Florida citrus processing plants it was found that there are measurable quantities of biotin, folic acid, and pyridoxine present.

However, these vitamins are present in only limited amounts in terms of practical nutritional significance. Ascorbic acid is present in significant amounts. Large amounts of inositol are present.

Many factors determine the amount of ascorbic acid present in citrus products including both environmental and genetic factors. For example, more ascorbic acid is found in fruit from outside branches well exposed to sunlight than from inside branches. More ascorbic acid is generally found in immature (early season) than ripe (late season) fruit.

Biotin, folic acid, and pyridoxine are present in such small amounts in citrus products that the consumption of citrus in the usual amounts will not be likely to contribute an amount of these vitamins that would be significant in meeting the vitamin requirements of the organism. On the other hand, citrus fruits remain as the most practical source of ascorbic acid in the natural economy. Also citrus products contain such an abundance of inositol that they are considered one of the richest natural sources of this vitamin. Inositol is an integral part of a phosphatide and of the important enzyme, pancreatic amylase. The compound is definitely a potentially important dietary factor.

Krehl, W. A., and Cowgill, George R.: *Vitamin Content of Citrus Products*, Food Research 15:79-191 (March) 1950.



Emotional Disturbance in Rheumatic Heart Disease

Rheumatic heart disease produces emotional disturbances in many children which should not be overlooked. In fact, all other chronic diseases may produce similar disturbances in children.

Psychologic hazards noted are (1) the physical incapacity during acute illness, often in the hospital for long periods, (2) separation from home and family, (3) the prolonged limitation of activity during convalescence, frequently in an institution, and (4) the threat of a permanent handicap.

Even after convalescence the need for continued restriction of activity sets these children apart and deprives them of normal relationships with the group. Frequently the death of a

friend, from the disease which the child himself has, is highly disturbing.

There is a surprising capacity for adjustment in a large number of children with rheumatic fever. Still there is some degree of emotional disturbance in a great many. The disturbance does not express itself in any characteristic pattern. The picture presented depends on the emotional state of the child prior to his illness. Many emotional maladjustments which are controlled under normal life circumstances, emerge when the strain of illness is added. No emotional upset precedes the first attack of rheumatic fever.

Even in children where the adjustment to illness appears to be wholesome, there is a tendency, especially during early convalescence, for the child to be more immature. He is more dependent upon adult relationships than is expected in children of the same chronologic age.

Illness is frightening to the child and anxiety is increased. The sick child tends to revert to a more infantile, dependent relationship with those caring for him. The emotional healthy child finds solace and reassurance in the nursing care. Physicians and nurses become adequate substitutes for his parents. On the other hand, the child whose emotional development has been unsatisfactory comes to enjoy his dependency and to exaggerate his helplessness. Many of them establish the habit of evasion and self-indulgence.

Illness interferes with the child's ability to assert himself in a healthy fashion. The normal child is more or less aggressive. The child with cardiac disease is afraid of aggressiveness as it may lead to censure, disapproval, or punishment. The punishment may be loss of parental affection.

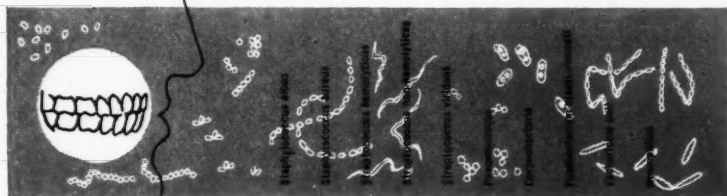
Vigorous active play is impossible in rheumatic fever and rheumatic heart disease. Inability of the child to compete adequately in sports is a serious blow to the psychic stability. It undermines his self-esteem.

These children are encouraged to express aggressive impulses through physical outlets which are physically safe. The goal of treatment is to help

the child accept the limitations imposed by the ailment. Care in the hospital should provide him with satisfactory emotional relationships. These should be substituted by parental understanding later. With adequate help and guidance the child will discover that the world is not as dangerous as it had seemed.

Bakwin, Harry: Rheumatic Fever and Rheumatic Heart Disease, J. Pediat. 39:258-259 (August) 1951.

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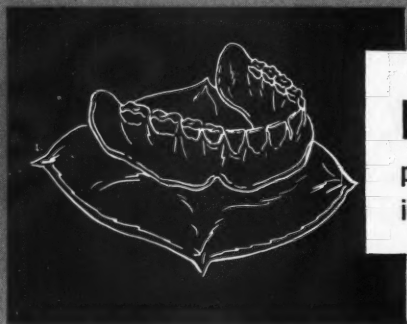
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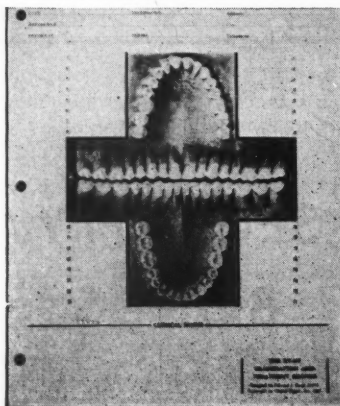
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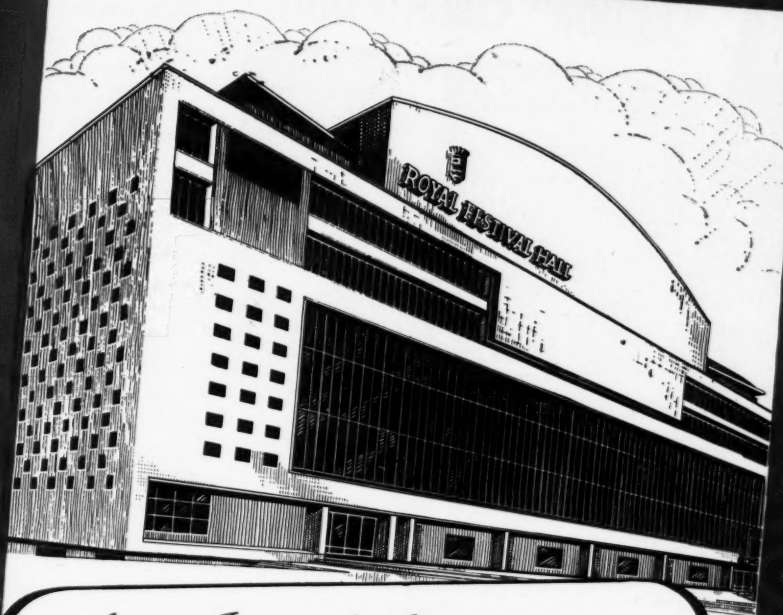
The Decline of Men in Public Life

Most of the dentists that I know are conscious of their future and have made some provisions for savings. They have no pensions to expect, they pay excessive taxes during their concentrated earning period, they have forgone present consumption to set aside something for their old age. Most dentists have bought insurance, government bonds, and common stocks. Some have entered the speculative field and have put their money into real estate, oil wells, and business ventures. In common with other prudent men they have worried about their future, their family's future, the future of their country.

The dentist who bought an insurance policy ten or fifteen years ago finds that his beneficiaries will receive about 40 cents on each dollar that he "invested." Nothing has happened to the insurance companies. They have not reduced their contractual benefits. If a death claim or an annuity return is for \$1000, the insurance companies may be expected to pay these claims to the penny of the contract. The beneficiaries are not being cheated by the insurance companies but by the government that has allowed inflation to expand to the place where a dollar paid years ago into an insurance contract is only worth 40 cents in purchasing power today. The same sorry fact prevails for the money that the dentist "invested" in government bonds and common stock.

What are we to do about this situation? Here are some sensible suggestions from the Committee for Constitutional Government:

"Government officials are trying again, to take more of your income



An Invitation...

IF YOU ARE attending the Congress of the Federation Dentaire Internationale which will be held in Royal Festival Hall, London, England, in July of this year, we extend to you a cordial invitation to visit the Amalgamated Dental Group's exhibit — which will occupy the center position in the exhibition hall.

We shall also be pleased to make arrangements for you to visit one of the Group's engineering plants, situated near London, to see at first hand the care, craftsmanship, and organization that insure the quality of all "Amalgamated Dental" products.

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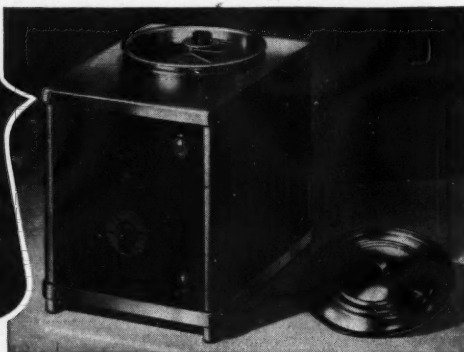
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and savings—to give to somebody else, at the same time undermining all citizens' constitutional liberty. What are you going to do about it?

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"You have already seen your savings melt away under government-managed and government-promoted inflation. You have seen government follow a consistent policy—through inflation and taxation—of cheapening and redistributing your savings to others. Now, in the steel fight, they're out to take your income from savings as well.

"Union leaders are hungry for power—and politicians need votes. The way to get votes—or so the Administration seems to think—is to

satisfy, at any cost, the ever-mounting appetites of dominant union officials for economically unwarranted but politically savory wage increases. The next logical step is to disguise and delay the fact that it is the public which ultimately pays for higher production costs, by making the people who save and invest (\$90,000 for each steel worker in latest, modern plants), take the first shock of the enormously increased cost of making goods.

"It's a simple pattern. First, the Wage Stabilization Board recommends a wage increase of 26 to 30 cents an hour—with the so-called 'public' members hardly able to conceal their union label underneath. The union then announces in effect a policy of 'whole hog or strike.' The President of the United States—called by the steel workers that 'rather friendly gentleman in the White House'—rushes in to say the unions must have whole hog, and that the cost must be paid for out of company profits.

"That's where you come in, Mr. Shareowner—because it's your money the 'rather friendly gentleman' is talking about—and giving away. He wants to cheapen—and redistribute to others—the savings you expected would protect and reward you now and in the future.

"It is palpably absurd to pretend that such enormous increases in costs can be paid for out of profits—at least for long. Ultimately, it is the public—all of us—who pay the bill. We will pay for it, in part, in whatever price increases occur. We'll pay for the rest in taxes, to make up for the taxes the government doesn't collect from the steel companies. If that doesn't take care of it all, we'll pay for it in higher prices and diluted money, to the extent that the government doesn't collect taxes and is forced to borrow, i.e., 'create,' money to pay its bills.

"But even though the public ultimately pays the bill, the savers and investors can be bent and broken as they absorb these initial shocks. It's not only the danger of galloping inflation—that's with us already. It is



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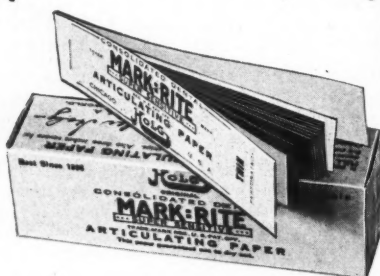
"But if the unions don't have enough power already to force the government to make you pay, the government has an answer for that. Impose the 'union shop,' force it on industry by government recommenda-

tion—so union leaders can tell employees: 'Pay your dues or lose your job.' That way there is less opportunity for resistance from the rank and file to any tyranny that exists. That makes it easier for a union official to throw his weight around. That makes it easier, Mr. Shareowner, to take your money. That gives the union officials still greater income and still greater political power over the President of the United States and other government officials.

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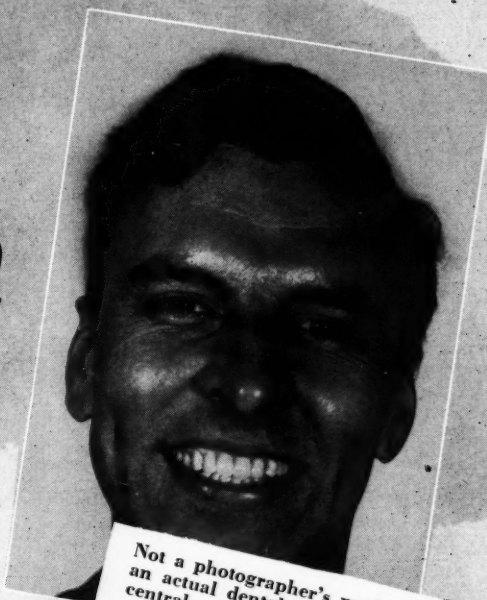
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"2. Support Senator Dirksen's effort to take away WSB's power to

recommend on such issues as the union shop and other matters that have nothing to do with wage stabilization.

"3. Protest against any misuses of war-granted powers, to force through such biased settlements as the President and Phil Murray are now attempting to make.

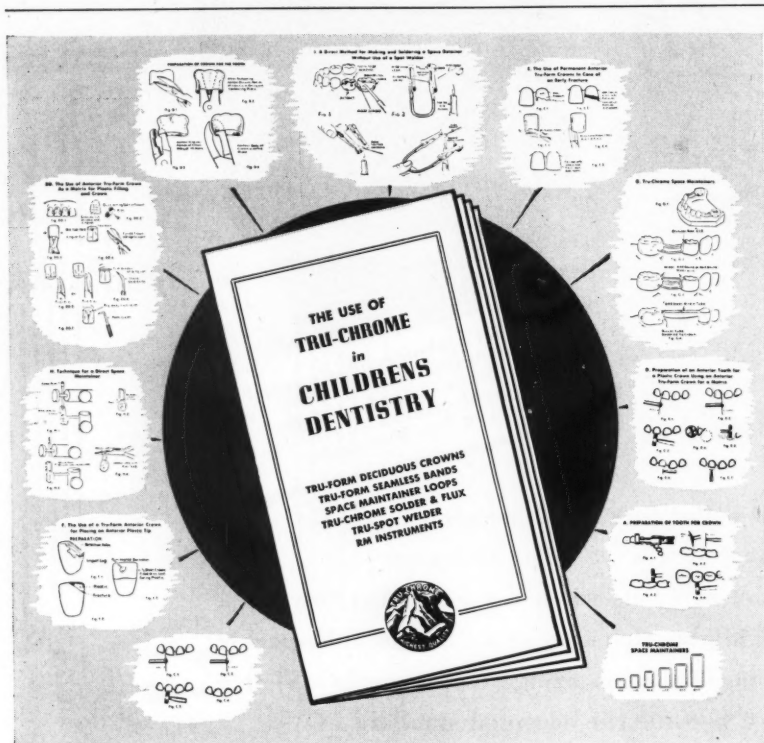
"4. Make this misuse of power by labor monopolies an issue in your community. Start discussion in service clubs, among associates, fellow shareowners. Organize meetings to

send protests to your Senators and Congressmen in Washington. **SPEAK UP NOW, BEFORE IT IS TOO LATE.**"

Civilizations rise to maturity and then decline as do all biologic organizations. In this sense, biologic is used to include anything that sustains and has life. Because civilizations are made up of people they are biologic entities. There is nothing to suggest that the civilization of the United States will not follow the same general pattern of decline. Collapse is speeded when the moral fibre of the country begins to disintegrate. When the people of a nation begin to lose their values, when class is put against class, when thievery and dishonesty in public office are looked upon with indifference, we may be certain that the prodromata of degeneration are upon us.

I can think of no weaker excuse for malfeasance in public office than to protest that the office holder is "personally honest." One may be scrupulous about his methods of acquiring money, entirely honorable in fulfilling his obligations, but if he looks with indifference on crookedness in the people working for him and under him, such a man is *not* honest. Attitudes toward money are only one aspect of honesty. When leadership at the top of any institution is corrupt or venal we cannot expect morality and high idealism in the lower echelons.

There are signs, favorable and bright signs, that the ordinary citizens—farmers, dentists, business men, labor union members, home makers—are aware of the ethical decline in the country. The awakening of interest among people in moral rearmament takes some significant forms. At a recent dental meeting I heard several of my dinner companions talk on a subject that I had never heard mentioned before at a dental meeting: church going. Several enterprising Protestant clergymen have organized early Sunday services for "golfers and gardeners." The dentists at the table where I sat were enthusiastic about this idea and some of them said that henceforth they would begin their Sunday of golf or



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Part of Chart 4, showing the patient what happens when a tooth is not replaced.

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THE CHART BOOK, *Visual Education in Dentistry*, can be a boon to your patients and to yourself. It aids in convincing patients of the dangers of neglect. It saves you minutes that mean money—*your* money. And although you save time, your explanations are definitely more complete, definitely more effective. And many patients are bound to pass along the word that you make a special effort to help them understand.

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gardening by attending these services. Another hopeful sign is the sensational TV success of a Catholic bishop in a program entitled "Life is Worth Living." This unsponsored program has put two other so-called

entertainment shows that appeared at the same time lower in the rating list. Still another encouraging sign is the interest in publications of B'nai B'rith that interpret the richness of Jewish life and culture to Christians

and to Jews so that both groups should be better people and better citizens.

Most of us are self-conscious to express ourselves on nonmaterial subjects, fearful that we may sound pompous or pious. If, however, we are to save the country and the world, we will need less atomic physics and more spiritual armament. —E.J.R.

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Nutrition in Geriatrics

(Continued from page 271)

the day is to be discouraged.

Alcohol: As a vasodilating substance, alcohol is of considerable assistance in the management and control of arteriosclerotic change in elderly persons. For this reason the judicious use of whisky or other spirituous liquors is indicated in the management of many aged patients.

Alcohol in moderation supplies quick fuel, relaxes tensions, and tends to increase the appetite. A glass of wine or a highball before dinner and another at bedtime is often constructive in increasing vigor and endurance in the elderly.

Adapted from *Journal of the American Medical Association* 142:1072-1077 (April) 1950.

Cavity Preparation

F. A. PEYTON, D.Sc., and
E. E. HENRY, M.S.,
Ann Arbor, Michigan

It is apparent that wide variations in physical conditions prevail during the operation of the rotating dental instrument and that there is some practical advantage to all methods or conditions as well as disadvantages. The favorable qualities should be balanced against the unfavorable qualities of each procedure and that method of cavity preparation chosen which offers the greatest comfort and satisfaction to both patient and operator. It is evident that the same purpose can be accomplished by several methods with essentially the same degree of satisfaction.

Wide Choice of Instruments—From

observation of the physical conditions that prevail when different instruments and operations are employed, it seems probable that many operators will prefer slow speeds of rotation, with suitable steel burs and carborundum stones, similar to those recommended and used for years. Others will prefer rapid speeds of rotation, with carbide burs and diamond instruments. Each should be able to accomplish his purpose if proper control is exercised in handling the respective cutting instruments.

Use of Water Spray—With the choice of some cutting instruments and pressures it is evident that the use of air or the water spray as a coolant is a necessary accessory if discomfort to the patient and damage to the tissue are to be avoided. Effective water spray and air attachments are available for such purposes. The clinical advantages and disadvantages of these accessories have been reported.

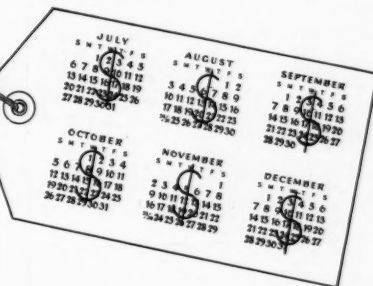
Incorporation of Airbrasive Technique—It seems probable that the airbrasive technique might be integrated with conventional practice for removal of tooth tissue in the process of cavity preparation. In some cases the Airdent unit may be used to the extent of elimination of the rotating instrument, but in all operations it can serve as a companion instrument for removal of varying proportions of the tissue.

Integration of All Instruments—There can be little doubt that fine restorative dentistry can be performed when any of several practices are followed. There are those in the practice of dentistry who will be able to integrate all the instruments and the proper techniques for their use and yet retain effective control of their operation. This should approach the ideal or optimum condition of service rendered.

Adapted from *New York Journal of Dentistry* 22:156-157 (April) 1952.

BUY SECURITY BONDS

In your ORAL HYGIENE this month



Budgeting Dental Fees for Better Dentistry

A budget plan which makes payment of dental bills in excess of \$200 easier for the patient, more certain for the dentist, and which should enable every wage-earner's family to have the complete dental service it requires, has been put into effect in the state of Rhode Island.

Three dentists, the State Society, and the Industrial Trust Company of Providence worked out the details. It is a plan which could be adapted to the needs of any locality, and which, if widely adopted, would tend to minimize the threat of government-administered dental health care.

John F. McGowan describes the plan in detail as a pattern which other state dental societies may wish to use as a basis for formulating their own budget plans.

★ ★ ★

"What Makes Dentists Tick?" asks Doctor C. W. Garleb, who claims that dentists' modesty has prevented them from explaining the many difficulties encountered in rendering certain types of dental service to their patients, and that therefore the patient often underrates the skill required. For this reason, practicing dentists do not enjoy the same respect that is accorded to the physician and surgeon. He suggests that dentists shake off the inferiority complex that seems to afflict the whole profession and "put dentistry out where it will show up like peacock feathers."

Thinking of retiring, sleeping late, sitting in the warm sun, going fishing, traveling, or following some other hobby? Doctor Leon D. Rivenburg tried it and found it quite a disappointment. However, he solved his problem by working out a semi-retirement plan that works like a charm. Now he enjoys all of the advantages of practice and leisure with no chance of boredom or stagnation.

★ ★ ★

"Avoiding the Plague of Malpractice Suits," by Doctor Lee A. Kapilow, lists eleven points for the dentist to check as precaution against legal involvement. Of particular interest is his discussion of the dentist's liability when he is employed by a commercial corporation, a government agency, or some other dentist, or when he asks another dentist to care for his patients during his absence from his office.

★ ★ ★

In the article, "Role of Mother in Problem-Child Dentistry," Doctor Aaron A. Moss stresses the importance of obtaining active co-operation from the mother as well as from the child. In his own practice, Doctor Moss uses a printed sheet of instructions to mothers which can be studied at leisure before the child's first appointment.

Much needless strain can be prevented by following this experienced dentist's advice.

See second cover D.D.6
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